Appendix I

Residuals Stability, Erosion Control, and Dike Stability Analysis

Appendix C

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BLASLAND, BOUCK & LEE, INC.

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The potential pathway for the largest environmental exposure to PCB from the WB/A-OU could result from failure in dike or residuals slopes, erosion of dikes, or a combination of these factors.

Failures associated with dike slopes and residuals slopes are typically evaluated based on the respective factor of safety (FS) under design and actual loading conditions. The FS is defined as the ratio of a structure's resistive forces compared to load and external forces. Generally, the FS takes the following form:

FS = Sum of resisting moments Sum of sliding moments

An FS of 2 implies that the structure has twice the strength required to resist the load and external forces. When there is imminent danger to human life or there is a major environmental impact (e.g., slope failure), the USEPA recommended minimum FS is 1.5 (USEPA, 1988c).

Residuals Stability

Preliminary analyses indicate that stability control measures are not required for the residuals at the existing grades (approximately 4 percent). The available shear strength data (greater than 880 lb/ft²) indicate that the existing conditions have an FS of at least 3.6 for A-Site. The FS conservatively assumes shear strength near the low end of measured values and no shear strength gain due to consolidation of the residuals under increased loads. Based on this information, residuals stability is not further discussed in the FFS portion of this report.

Erosion Control

Based on analysis of potential erosional forces associated with the Kalamazoo River, erosion control measures may be necessary to prevent scour and erosion of the dikes during high flow conditions. Potential methods of addressing the erosional forces created by river flow include placement of sheet piling, reno mattress, revetment blanket, or riprap along the dike slopes.

Two of the four options (reno mattress and rip-rap) are similar in principle: each uses stone to limit the water velocity along the surface of the dike, thus minimizing the amount of scour. The main difference between the reno mattress and the rip-rap is the addition of hexagonal wire mesh baskets for structural formation of the reno mattress. The last erosion control device evaluated was the revetment blanket, which involves pumping of a concrete/grout mixture into a pre-sized liner system (forming a barrier structure). Of the last three erosion control devices discussed, installation of rip-rap (dumped or hand-placed) is the simplest and most cost-effective option evaluated. However, it should be

noted that as part of remedial design, further comparison of sheet piling, rip-rap, reno mattress, and revetment blanket will be conducted.

Dike Stability

The stability of the existing dikes was also evaluated. Based on a preliminary evaluation, the FS for the existing dikes is approximately 1.0 to 1.4 for the A-Site. As previously noted, an FS of 1.5 or greater is typically recommended. Possible dike stabilization measures which could be utilized to increase the dike's FS include gabion walls, soil nailing/insert wall, and slope modification.

Slope modification consists of extending the toe of the existing dike into the river to create a less steep slope and therefore a higher FS. For purposes of the FFS portion of this report, modified dike slopes of 2H:1V and 3H:1V were evaluated. The resulting factors of safety would be approximately 1.5 to 1.6 for a 2H:1V slope, and approximately 2.2 for a 3H:1V slope. Flattening the slopes could be accomplished by cutting and/or filling.

Soil nailing/insert wall consists of inserting metal reinforcing bars (rebar) and concrete grout for tension support. The extra support provides the dike with an FS of at least 1.5. Increased quantities of rebar and grout would increase the FS for the dikes.

A gabion consists of rock (e.g., 9-inch diameter) bound by wire mesh baskets into blocks. The blocks can vary in size, an example block dimension would be 3 feet by 6 feet. The gabions would be placed and stacked along the dike to form a gabion wall. The wall acts as a retaining wall to support the slope of the dike. An FS of 1.5 or greater would be achieved.

Of the three alternatives discussed, the alternative which provides the greatest FS is slope modification to 3H:1V; however, the other alternatives provide an FS of approximately 1.5 or greater. Of the three (slope modification to 2H:1V, soil nailing/insert wall, and gabion wall), the least-costly would be the gabion wall.

According to USGS data (refer to the DCS) there was one flood event in 1985 that exceeded the USGS 25-year flood elevation at the Comstock gaging station, which is located approximately 1.5 miles upstream of the OU. Between 1985 and 1989 there were several flood events which approached the 10-year USGS flood discharge level. During these events, the dikes at the A-Site have been stable. The effect any flood events could have on the OU is dependent upon factors such as channel geometry and the overflow of the opposite river bank. These physical characteristics may buffer the effect that a large flood event has on the OU.

The potential for channelization, which may occur as a result of the dike stabilization effort, would be evaluated during the remedial design. In addition, due to limited available geotechnical data for the Willow Boulevard Site, for purposes of the FFS, it was assumed that residuals stability, erosion control, and dike stability at the Willow

Boulevard Site would be consistent with that of the A-Site. This information will be confirmed as part of remedial design for the WB/A-OU prior to the commencement of remedial construction activities.

Appendix J

Pertinent Appendix from Technical Memorandum 10 (CDM, 2002b)

TRANSECT: K	PT5	Date (Collected:	08/10/93	River Widt	h (ft):	188.0	Distance to Right Edge of Water (ft): 19
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
30	2.9	1.20	4.20	3.60	2.90	COARSE	0-0.33	GREY BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.60	GREY SILT, LOOSE AND FLUFFY
							0.60-1.20	GREY FINE TO MEDIUM SAND
							1.20-1.80	GREY MEDIUM/COARSE SAND AND GRAVEL
·							1.80-2.90	GREY FINE TO MEDIUM SAND
54	2.5	2.40	2.30	2.10	1.30	COARSE	0-0.33	BROWN MEDIUM TO COARSE SAND AND GRAVEL
·							0.00-0.20	GREY VERY FINE SILT
ı							0.20-0.60	GREY-BROWN FINE TO MEDIUM SAND
							0.60-1.30	GREY-BROWN MEDIUM TO COARSE SAND AND GRAVEL
78	2.5	2.10	1.50	1,50	1.45	COARSE	0-0.33	BROWN MEDIUM TO COARSE SAND AND GRAVEL
							0.00-0.50	BROWN MEDIUM TO COARSE SAND WITH GREY FINE SILTY MATERIAL
							0.50-1.45	GREY FINE TO MEDIUM SAND
104	2.0	2.20	3.10	3.00	2.70	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND, SOME GRAVEL
		•					0.00-0.30	BROWN FINE TO MEDIUM SAND
							0.30-1.00	LIGHT GREY-BROWN FINE TO MEDIUM SAND
							1.00-2.70	GREY FINE SAND WITH SOME MEDIUM SAND AND PIECES OF WOOD
128	2.2	2.00	2.80	2.60	1.60	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND
							0.00-0.20	BROWN FINE TO MEDIUM SAND
							0.20-1.60	grey fine to coarse sand

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TRANSECT: 1	KPT5	Date (Collected:	08/10/93	River Wid	th (ft):	188.0	Distance to Right Edge of Water (ft): 19
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval (ft)	Description
152	2.2	1.90	2.60	2.20	1.60	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND
							0.00-0.10	GREY FINE SILTY PLUFFY MATERIAL
							0.10-0.60	BROWN FINE TO MEDIUM SAND
1							0.60-1.60	GREY FINE TO COARSE SAND
176	2.7	1.85	1.40	1.40	1.40	COARSE	0-0.33	BROWN FINE TO COARSE SAND
					•		0.00-0.10	GREY FLUFFY SILTY MATERIAL
							0.10-0.60	BROWN MEDIUM TO COARSE SAND
							0.60-1.40	LIGHT GREY FINE TO MEDIUM SAND
200	2.4	0.55	2.60	2.60	2.00	FINE	0-0.33	GREY FINE SAND
i'							0.00-0.80	DARK GRBY PINE SAND, SILT
,							0.80-2.00	GREY FINE TO MEDIUM SAND

TRANSEC	T: KPT	r6	Date C	collected:	08/11/93	River Widt	h (ft):	184.0	Distance to Right Edge of Water (ft): 20
Distanc Prom Right B	W ank D	Water Depth	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
28	•	1.7	0.00	3.30	2.00	1.95	COARSE	0-0.33	DARK BROWN FINE TO MEDIUM SAND, SOME GRAVEL
1						•		0.00-0.20	DARK BROWN FINE TO MEDIUM SAND
								0.20-1.20	DARK GREY-BROWN FINE TO MEDIUM SAND
.]								1.20-1.95	GREY FINE TO COARSE SAND
53		1.5	0.00	1.50	1.30	1.30	COARSE	0-0.33	BROWN MEDIUM TO COARSE SAND AND GRAVEL
								0.00-0.20	DARK BROWN COARSE SAND AND GRAVEL
1								0.20-1.30	LIGHT BROWN FINE TO COARSE SAND, SOME GRAVEL
76		2.0	0.00	1.10	1.20	1.15	COARSE	0-0.33	DARK BROWN FINE TO COARSE SAND AND GRAVEL
								0.00-0.40	BROWN MEDIUM TO COARSE SAND AND GRAVEL
								0.40-1.15	GREY FINE TO MEDIUM SAND, SOME COARSE SAND AND GRAVEL
98		2.1	0.00	1.30	1.60	1.55	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND, SOME COARSE SAND AND GRAVEL
								0.00-0.60	BROWN FINE TO COARSE SAND AND GRAVEL
1								0.60-1.40	GREY FINE TO MEDIUM SAND
								1.40-1.55	GREY MEDIUM TO COARSE SAND AND GRAVEL
125		2.2	0.00	3.10	3.00	2.90	COARSE	0-0.33	BROWN MEDIUM SAND, SOME FINE SAND AND GRAVEL
ļ								0.00-0.40	BROWN FINE TO COARSE SAND AND GRAVEL
1								0.40-0.70	DARK BROWN TO BLACK FINE SAND
								0.70-2.90	GREY FINE SAND, SOME MEDIUM SAND

TRANSECT:	KPT6	Date (Collected:	08/11/93	River Wid	th (ft):	184.0	Distance to Right Edge of Water (ft): 20
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval (ft)	Description
148	2.8	0.00	4.60	4.60	4.10	COARSE	0-0.33	BROWN FINE TO MEDIUM SAND, SOME GRAVEL
							0.00-0.30	BROWN FINE TO MEDIUM SAND
							0.30-1.50	GREY FINE TO COARSE SAND AND GRAVEL
							1.50-4.10	GRBY TO LIGHT GRBY FINE SAND
166	3.4	0.00	4.50	3.00	2.30	COARSE	0-0.33	BROWN FINE TO MEDIUM SAND, SOME COARSE SAND AND GRAVEL
1							0.00-0.50	BROWN FINE TO COARSE SAND AND GRAVEL
							0.50-0.90	GREY FINE TO MEDIUM SAND
4							0.90-1.10	LARGE GREY ROCK
							1.10-2.30	FINE GREY SAND
191	2.8	0.00	1.80	1.70	1.20	COARSE	0-0.33	GREY-BROWN FINE SAND AND SILT, SOME GRAVEL
							0.00-0.20	FINE TO COARSE SAND AND GRAVEL
<u>'</u>							0.20-1.20	GREY FINE SAND AND SILT

TRANSECT: 1	D707	Data (Collected:	09/11/93	River Widt	h (#+)-	178 0	Distance to Right Edge of Water (ft): 25
}		Date	.011900801	06/11/93	KIVEL WIGO	(20)1	176.0	precence to Argue augus of weets (10). 22
Prom Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
35	1.7	0.00	0.70	0.50	0.40	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
							0.00-0.40	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
57	1.9	0.00	2.60	2.20	1.60	COARSE	0-0.33	BROWN FINE TO MEDIUM SAND, SOME GRAVEL
*							0.00-0.40	BROWN FINE TO COARSE SAND, SOME GRAVEL
<u> </u>							0.40-1.10	GREY-BROWN FINE TO MEDIUM SAND
							1.10-1.40	DARK BROWN TO BLACK FINE SAND
							1.40-1.60	GREY FINE SAND
79	1.9	0.00	1.20	1.20	0.70	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND AND GRAVEL
							0.00-0.30	BROWN MEDIUM TO COARSE SAND AND GRAVEL
		**************************************		····			0.30-0.70	DARK GREY FINE SAND
99	2.6	0.00	1.10	1.10	0.60	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND, SOME GRAVEL
,							0.00-0.30	GREY-BROWN FINE TO MEDIUM SAND, SOME GRAVEL
							0.30-0.60	GREY FINE TO MEDIUM SAND WITH SOME GRAVEL
125	3.2	0.00	0.80	1.00	0.60	COARSE	0-0.33	BROWN MEDIUM TO COARSE SAND, SOME GRAVEL, SOME FINE SAND
.							0.00-0.30	BROWN MEDIUM TO COARSE SAND AND GRAVEL
							0.30-0.60	LIGHT BROWN FINE TO MEDIUM SAND
146	2.4	0.00	1.50	1.00	0.70	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
<u> </u>							0.00-0.70	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
171	1.3	0.00	1.80	1.40	0.70	COARSE	0-0,33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
1							0.00-0.70	GREY-BROWN FINE TO COARSE SAND AND GRAVEL

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TRANSECT	KPT7	Date (Date Collected: 08/11/93			th (ft):	178.0	Distance to Right Edge of Water (ft): 25
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval (ft)	Description
195	1.7	0.00	3.40	3.00	2.50	FINE	0-0.33	DARK BROWN SILT WITH FINE SAND AND ORGANIC MATTER
'							0.00-0.20	BROWN FINE SAND
							0.20-1.00	DARK BROWN TO BLACK FIME SAND AND SILT
							1.00-1.25	GREY FINE TO MEDIUM SAND, SOME COARSE SAND

TRANSECT: K	PT8	Date (collected:	08/11/93	River Widtl	h (ft):	177.0	Distance to Right Edge of Water (ft): 26
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment & Recovered (ft)	Sediment Type	Interval (ft)	Description
35	1.3	0.00	1.10	0.80	0.60	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND, SOME GRAVEL
							0.00-0.60	GREY-BROWN FINE TO MEDIUM SAND, SOME GRAVEL
58	1.9	0.00	1.60	1.10	0.90	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.30	BROWN FINE TO MEDIUM SAND
							0.30-0.90	DARK GREY FINE TO COARSE SAND, SOME GRAVEL
79	1.7	0.00	1.40	1.10	0.80	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND
							0.00-0.40	FINE TO MEDIUM BROWN SAND, SOME COARSE SAND
							0.40-0.60	DARK BROWN TO BLACK FINE SAND
!							0.60-0.80	GREY FINE SAND
104	1.9	0.00	2.20	2.10	1.30	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND
							0.00-0.30	BROWN FINE TO COARSE SAND, SOME GRAVEL
							0.30-1.30	GREY FINE TO COARSE SAND, SOME GRAVEL
127	2.7	0.00	1.40	1.40	1.20	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
······································		,		······································		· · · · · · · · · · · · · · · · · · ·	0.00-1.20	BROWN TO LIGHT BROWN FINE TO COARSE SAND
150	3.5	0.00	1.50	1.50	1.10	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND, SOME GRAVEL AND SOME FINE SAND
		···					0.00-1.10	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
.69	4.2	0.00	0.80	1.00	1.00	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND SOME GRAVEL
							0.00-0.40	BROWN FINE TO MEDIUM SAND, SOME GRAVEL
			•				0.40-1.00	GREY FINE TO MEDIUM SAND

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١	TRANSECT: K	PT8	Date C	ollected:	08/11/93	River Width (ft): 177.0			Distance to Right Edge of Water (ft): 26
<u> </u>	Distance Prom Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval (ft)	Description
	191	3.2	0.00	1.30	1.10	1.00	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND, SOME GRAVEL AND SOME FINE SAND
			•					0.00-0.40	BROWN MEDIUM TO COARSE BAND, SOME GRAVEL
	·			<u>-</u>				0.40-1.00	GREY FINE TO MEDIUM SAND

TRANSECT: R	PT9	Date (Collected:	08/12/93	River Widt	h (ft):	148.0	Distance to Right Edge of Water (ft): 19
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
25	0.8	0.57	1.60	1.20	1.00	PINE	0-0.33	BROWN FINE SAND, DARK BROWN TO BLACK FINE SAND AND ORGANIC MATTER
							0.00-0.20	Brown Fine Sand
	·						0.20-1.00	DARK BROWN TO BLACK FINE TO MEDIUM SAND, SOME GRAVEL
48	1.6	1.25	1.90	1.90	0.90	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.10	BROWN COARSE SAND AND GRAVEL
							0.10-0.30	BROWN FINE TO MEDIUM SAND
							0.30-0.90	GREY FINE TO COARSE SAND
68	1.4	1.65	3.00	2.70	2.00	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.30	BROWN FINE TO COARSE SAND, SOME GRAVEL
							0.30-1.20	GREY FINE TO MEDIUM SAND
							1.20-2.00	GREY FINE TO COARSE SAND, SOME GRAVEL
88	2.2	2.10	2.30	2.30	1.50	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.30	BROWN FINE TO COARSE SAND, SOME GRAVEL
							0.30-1.50	MEDIUM TO COARSE SAND, SOME FINE SAND
109	3.0	2.20	3.00	3.00	2.80	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-1.60	BROWN FINE TO COARSE SAND
							1.60-2.80	LIGHT BROWN FINE SAND
129	3.2	2.70	2.90	2.90	2.40	COARSE	0-0.33	GREY-BROWN FINE SAND, SOME MEDIUM TO COARSE SAND AND GRAVEL
							0.00-2.40	BROWN AND GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL

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TRANSECT: F	KPT9	Date Collected: 08/12/93			River Width (ft): 148.0			Distance to Right Edge of Water (ft): 19
Distance Prom Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval (ft)	Description
150	2.1	2.10	2.50	2.50	2.00	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.10	BROWN COARSE SAND AND GRAVEL
							0.10-0.40	BROWN FINE TO MEDIUM SAND
<u>.</u>							0.40-2.00	GREY FINE TO COARSE SAND, SOME GRAVEL

TRANSECT: K	PT10	Date (Collected:	08/12/93	River Widt	h (ft):	187.0	Distance to Right Edge of Water (ft): 30
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
41	0.8	0.00	3.10	2.70	1.80	FINE	0-0.33	GREY-BROWN AND DARK GREY FINE SAND WITH ORGANIC MATTER
							0.00-0.20	BROWN FINE SAND
							0.20-0.60	GREY CLAY
							0.60-1.30	DARK GREY TO BLACK FINE SAND
•							1.30-1.80	DARK GREY TO BLACK FINE TO COARSE SAND, SOME GRAVEL
72	1.5	0.00	3.10	2.80	2.70	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.20	BROWN FINE SAND
							0.20-1.80	GREY AND DARK GREY FINE TO COARSE SAND
							1.80-2.70	GREY FINE TO MEDIUM SAND
101	2.8	0.00	3.20	3.20	3.00	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND, SOME FINE SAND
r							0.00-0.20	BROWN MEDIUM TO COARSE SAND, SOME FINE SAND
							0.20-2.30	LIGHT GRBY FINE TO COARSE SAND
•					,		2.30-3.00	LIGHT GREY FINE TO COARSE SAND AND GRAVEL
132	3.2	0.00	2.60	2.20	1.50	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
						•	0.00-1.50	BROWN FINE TO COARSE SAND, SOME GRAVEL
164	2.2	0.00	3.00	2.80	1.60	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND AND GRAVEL, SOME FINE SAND
							0.00-0.20	BROWN FINE TO MEDIUM SAND
売 ——							0.20-1.60	LIGHT BROWN & GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL

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TRANSECT: F	PT10	Date C	Collected:	08/12/93	River Wid	th (ft):	187.0	Distance to Right Edge of Water (ft): 30
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval (ft)	Description
184	2.2	0.00	3.50	3.00	2.40	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND AND GRAVEL, SOME FINE SAND
i							0.00-0.20	BROWN MEDIUM TO COARSE SAND AND GRAVEL
							0.20-2.00	GREY FINE TO COARSE SAND
							2.00-2.40	GREY FINE SAND
211	1.1	0.00	2.70	2.20	1.80	FINE	0-0.33	DARK GREY FINE SAND, SOME ORGANIC MATTER
							0.00-0.30	GREY FINE SAND, SOME ORGANIC MATTER
							0.30-1.80	GREY FINE TO MEDIUM SAND, SOME COARSE SAND

TRANSECT:	KPT11	Date (Collected:	08/12/93	River Widt	th (ft):	342.0	Distance to Right Edge of Water (ft): 24
Distance Prom Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
51	0.4	0.00	5.40	5.30	3.80	COARSE	0-0.33	BROWN AND DARK GREY FINE TO MEDIUM SAND, SOME ORGANIC MATTER
İ							0.00-0.20	BROWN FINE SAND
							0.20-1.00	DARK GREY TO BLACK FINE SAND, SOME ORGANIC MATTER
							1.00-3.80	GREY MEDIUM TO COARSE SAND
106	0.9	0.00	8.50	7.10	5.60	COARSE	0-0.33	DARK GREY FINE TO MEDIUM SAND WITH ORGANIC MATTER
							0.00-0.40	DARK GREY FINE TO MEDIUM SAND WITE SOME ORGANIC MATTER
							0.40-2.60	GREY FINE TO COARSE SAND
							2.60-3.70	DARK GREY FINE TO MEDIUM SAND, SOME ORGANIC MATTER
					<u></u>		3.70-5.60	GREY MEDIUM TO COARSE SAND
164	4.2	0.00	5.50	5.50	4.70	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
							0.00-0.90	GREY-BROWN FINE TO COARSE SAND
,							0.90-2.60	GREY FINE TO MEDIUM SAND
1		· · · · · · · · · · · · · · · · · · ·					2.60-4.70	BROWN SILT-LIKE MATERIAL
213	1.9	0.00	1.60	1.20	1.00	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND AND GRAVEL, SOME FINE SAND
							0.00-0.30	BROWN MEDIUM TO COARSE SAND, SOME GRAVEL AND PINE SAND
							0.30-1.00	GREY-BROWN FINE TO COARSE SAND

TRANSECT: K	PT11	Date (Collected:	08/12/93	River Widt	h (ft):	342.0	Distance to Right Edge of Water (ft): 24
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
271	1.1	0.00	4.30	3.80	3.20	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND, SOME FINE SAND
							0.00-0.40	GREY-BROWN MEDIUM TO COARSE SAND, SOME FINE SAND
							0.40-1.50	DARK GREY FINE TO MEDIUM SAND
							1.50-2.50	GREY FINE TO COARSE SAND
ı							2.50-3.20	GREY FINE TO MEDIUM SAND
327	0.4	0.00	4.60	3.10	2.60	Fine	0-0.33	GREY-BROWN AND DARK GREY FINE SAND
							0.00-0.20	BROWN FINE SAND
							0.20-2.10	GREY AND DARK GREY FINE SAND AND SOME MEDIUM SAND
							2,10-2,60	BROWN PIECE OF WOOD
486	0.2	0.00	4.30	2.60	1.60	FINE	0-0.33	DARK GREY SILT AND ORGANIC MATTER
•							0.00-0.50	DARK GREY SILT AND ORGANIC MATTER
•							0.50-1.40	GREY CLAY
'							1.40-1.60	GREY MEDIUM TO COARSE SAND
562	0.2	0.00	2.90	2.80	1.50	FINE	0-0.33	DARK GREY TO BLACK SILT, ORGANIC MATTER AND SOME CLAY
							0.00-0.50	DARK GREY TO BLACK SILT, ORGANIC MATTER, AND SOME CLAY
							0.50-1.30	GREY CLAY
G							1.30-1.50	GREY MEDIUM TO COARSE SAND

TRANSECT: K	PT12	Date (Collected:	08/13/93	River Wid	th (ft):	145.0	Distance to Right Edge of Water (ft): 14
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval (ft)	Description
24	4.0	0.00	4.10	4.10	3.20	COARSE	0-0.33	GREY-BROWN MEDIUM TO COARSE SAND WITH A LOT OF GRAVEL
							0.00-0.20	GREY-BROWN GRAVEL
							0.20-0.80	GREY FINE TO MEDIUM SAND
							0.80-1.70	BLACK SILT-LIKE MATERIAL
							1.70-3.20	LIGHT GREY FINE SAND
47	4.1	0.00	2.00	2.00	1.60	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.30	BROWN FINE TO COARSE SAND
							0.30-0.50	GREY FINE TO COARSE SAND
							0.50-0.70	DARK GREY TO BLACK FINE TO COARSE SAND
							0.70-1.60	GREY FINE TO COARSE SAND, SOME GRAVEL
69	3.3	0.00	5.70	5.70	5.20	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND AND GRAVEL
							0.00-0.20	BROWN FINE TO COARSE SAND, SOME GRAVEL
							0.20-2.80	GREY AND DARK GREY FINE TO COARSE SAND
							2.80-4.90	LIGHT GREY FINE SAND
							4.90-5.20	GREY VERY FINE SAND
90	2.8	0.00	6.40	6.40	6.10	COARSE	0-0.33	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
							0.00-0.80	GREY-BROWN FINE TO COARSE SAND
							0.80-3.00	GREY AND DARK GREY FINE TO MEDIUM SAND
							3.00-3.30	LIGHT GREY FINE SAND
ス 切 05							3.30-6.10	LIGHT GREY VERY FINE SAND

TRANSECT: R	OT12	Date (Collected:	08/13/93	River Wid	th (ft):	145.0	Distance to Right Edge of Water (ft): 14
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval	Description
110	2.4	0.00	3.20	3.20	1.50	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND, SOME COARSE SAND
							0.00-0.50	GREY-BROWN FINE TO MEDIUM SAND, SOME COARSE SAND
1							0.50-0.90	DARK GREY FINE TO MEDIUM SAND
							0.90-1.50	GREY FINE TO COARSE SAND, SOME GRAVEL
131	2.9	0.00	2.80	2.80	2.10	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND, SOME COARSE SAND, SOME GRAVEL
							0.00-2.10	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
151	2.1	0.00	2.30	2.30	1.00	COARSE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND, SOME COARSE SAND
							0.00-1.00	GREY-BROWN FINE TO MEDIUM SAND, SOME COARSE SAND

	TRANSECT: K	PT13	Date C	collected:	08/13/93	River Widt	h (ft):	180.0	Distance to Right Edge of Water (ft): 28
	Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
ſ	39	0.8	0.63	7.20	7.00	5.90	FINE	0-0.33	GREY-BROWN FINE SAND WITE ORGANIC MATTER
İ								0.00-0.40	GREY-BROWN FINE SAND
l								0.40-1.10	GREY AND DARK GREY CLAY-LIKE MATERIAL
ł	i							1.10-1.80	GREY FINE SAND
								1.80-2.10	DARK GREY FINE SAND
								2.10-3.10	GREY FINE TO HEDIUM SAND
								3.10-5.90	GREY FINE SAND WITH DARK GREY TO BLACK SILT-LIKE MATERIAL
1	63	0.8	0.60	7.60	7.60	5.60	PINE	0-0.33	GREY-BROWN FINE SAND WITH ORGANIC MATTER
								0.00-1.80	GREY AND DARK GREY FINE SAND
ľ								1.80-3.00	GREY AND DARK GREY FINE TO COARBE SAND
1								3.00-3.60	BLACK SILT-LIKE MATERIAL
								3.60-5.10	GREY FINE TO MEDIUM SAND
						·	 	5.10-5.60	BLACK SILT-LIKE MATERIAL
l	86	2.0	0.81	6.30	6.00	5.20	COARSE	0-0.33	LIGHT BROWN FINE TO COARSE BAND AND GRAVEL
1								0.00-1.70	Brown to grey-brown fine to coarse sand and gravel
ı								1.70-2.30	DARK BROWN TO BLACK SILT-LIKE MATERIAL
大								2.30-3.00	GREY-BROWN FINE TO COARSE SAND, SOME GRAVEL
93	•							3.00-3.70	DARK BROWN TO DARK GREY FINE TO COARSE SAND
XB602U3	i i							3.70-4.30	DARK GREY FINE TO MEDIUM SAND WITH TRACE SILT
[J.J.7	·							4.30-5.20	DARK GREY/BLACK/GREY FINE-MEDIUM SAND, ORGANICS 4.3'-4.7'

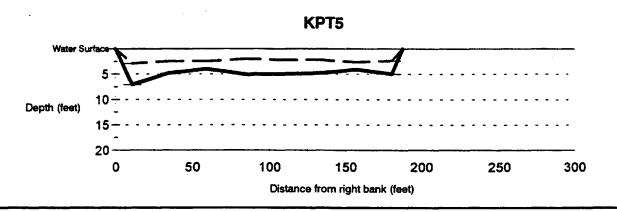
TRANSECT: K	PT13	Date	Collected:	08/13/93	River Widt	th (ft):	180.0	Distance to Right Edge of Water (ft): 28
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
107	3.5	1.57	6.80	5.70	4.60	COARSE	0-0.33	BROWN FINE TO COARSE SAND WITE GRAVEL
							0.00-0.60	BROWN FINE TO COARSE SAND WITE GRAVEL
							0.60-2.20	DARK GREY FINE TO MEDIUM SAND
							2.20-3.00	DARK GREY TO BLACK SILT-LIKE MATTER WITH FINE SAND
							3.00-4.60	LIGHT GREY TO GREY FINE TO MEDIUM SAND
131	4.3	2.50	3.70	3.10	2.20	COARSE	0-0.33	BROWN PINE TO COARSE SAND WITH GRAVEL
							0.00-1.10	BROWN FINE TO COARSE SAND AND GRAVEL
							1.10-1.30	DARK BROWN TO GREY FINE TO COARSE SAND
							1.30-1.40	DARK BROWN TO BLACK FINE TO MEDIUM SAND WITE SILTY MATTER
							1.40-2.20	GREY FINE TO COARSE SAND AND GRAVEL
155	3.4	2.00	4.40	4.40	2.90	COARSE	0-0.33	BROWN FINE TO COARSE SAND WITH GRAVEL
•							0.00-0.10	GRAVEL
							0.10-0.30	BROWN FINE TO COARSE SAND, SOME GRAVEL
							0.30-0.60	DARK GREY FINE TO MEDIUM SAND, WOOD DEBRIS
							0.60-1.50	DARK GREY TO BROWN FINE SAND WITH BLACK SILT MATERIAL
							1.50-2.90	GREY FINE TO COARSE SAND
179	3.4	1.60	4.60	4.20	2.60	COARSE	0-0.33	BROWN TO GREY FINE TO COARSE SAND AND GRAVEL
							0.00-1.70	BROWN TO GREY FINE TO COARSE SAND WITH GRAVEL
							1.70-2.10	DARK GREY FINE TO MEDIUM SAND, TRACE SILT
							2.10-2.60	DARK GREY PINE SAND WITE BLACK SILT

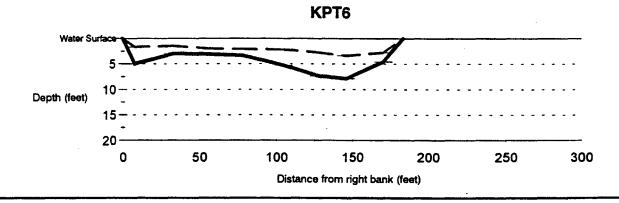
1	TRANSECT: K	PT13	Date C	Collected:	08/13/93	River Widt	th (ft):	180.0	Distance to Right Edge of Water (ft): 28
1	Distance Prom Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)		Interval (ft)	Description
	197	2.6	1.22	7.60	6.70	5.60	COARSE	0-0.33	BROWN TO GREY FINE TO COARSE SAND WITE GRAVEL
								0.00-0.50	BROWN TO GREY FINE TO COARSE SAND, SOME GRAVEL
								0.50-1.40	DARK GREY TO BLACK FINE SAND WITH SILT
								1.40-2.80	GREY MEDIUM TO COARSE SAND AND GRAVEL, TRACE FINE SAND
								2.80-3.40	DARK GREY FINE SAND, TRACE SILT AND WOOD DEBRIS
								3.40-5.60	LIGHT BROWN FINE TO MEDIUM SAND

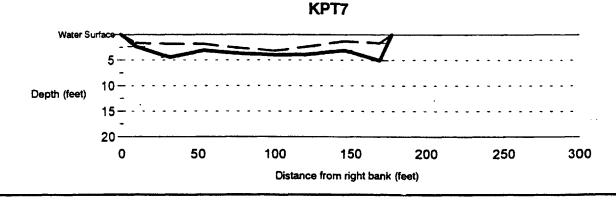
TRANSECT: K	PT14	Date (Collected:	08/16/93	River Wid	h (ft):	472.0	Distance to Right Edge of Water (ft): 13
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment Recovered (ft)	Sediment Type	Interval (ft)	Description
23	3.0	0.00	7.70	7.60	6.40	FINE	0-0.33	DARK GREY FINE TO COARSE SAND WITE ORGANIC MATTER
							0.00-2.10	GREY & DARK GREY FINE-MEDIUM SAND, SOME ORGANICS & GRAVEL
							2.10-6.40	LIGHT BROWN FINE SAND
89	4.0	0.00	6.30	6.30	4.10	PINE	0-0.33	BROWN TO DARK BROWN SILT
							0.00-1.00	BROWN TO DARK BROWN SILT
							1.00-1.30	GREY CLAY-LIKE MATERIAL
							1.30-2.70	Black Silt-Like Material
							2.70-3.00	GREY FINE TO MEDIUM SAND
							3.00-4.10	LIGHT BROWN FINE SAND
149	2.4	0.00	8.40	6.70	5.20	PINE	0-0.33	DARK GREY-BROWN FINE TO MEDIUM SAND WITH ORGANIC MATTER
							0.00-0.20	BROWN FINE TO MEDIUM SAND
							0.20-1.40	DARK GREY FINE SAND, SOME ORGANIC MATTER
							1.40-3.20	GREY FINE TO COARSE SAND
							3,20-5.00	BLACK SILT-LIKE MATERIAL
							5.00-5.20	grey fine sand
209	4.0	0.00	6.10	6.10	5.40	FINE	0-0.33	GREY-BROWN FINE SAND, SOME ORGANIC MATTER
							0.00-0.90	GREY-BROWN & DARK BROWN FINE SAND, SOME ORGANIC MATTER
							0.90-3.10	GREY AND GREY-BROWN FINE TO COARSE SAND
							3.10-4.50	DARK GREY FINE SAND WITE SOME ORGANIC MATTER
))							4.50-5.40	LIGHT GREY-BROWN VERY FINE SAND

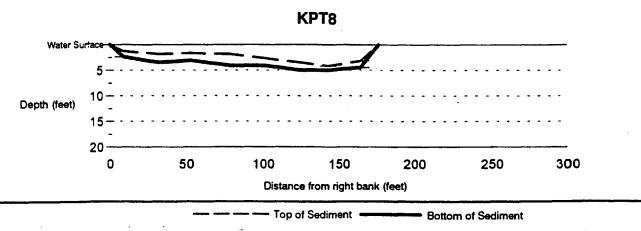
TRANSECT: K	PT14	Date (Collected:	08/16/93	River Widt	h (ft):	472.0	Distance to Right Edge of Water (ft): 13
Distance From Right Bank (ft)	Water Depth (ft)	Water Velocity (fps)	Sediment Depth (ft)	Sediment Penetrated (ft)	Sediment a Recovered (ft)	Sediment Type	Interval (ft)	Description
274	1.5	0.00	8.20	7.30	5.80	PINE	0-0.33	GREY-BROWN FINE SAND WITH A LOT OF ORGANIC MATTER
¥							0.00-0.40	GREY-BROWN FINE SAND WITH A LOT OF ORGANIC MATTER
							0.40-5.20	GREY AND DARK GREY FINE TO COARSE SAND
							5.20-5.80	BLACK SILT-LIKE MATERIAL
341	2.5	0.00	6.80	6.20	4.40	FINE	0-0.33	GREY-BROWN FINE TO MEDIUM SAND
				,			0.00-0.40	GREY-BROWN FINE TO MEDIUM SAND
							0.40-2.60	GREY & DARK GREY FINE TO MEDIUM SAND WITE ORGANIC MATTER
							2.60-4.40	BLACK SILT-LIKE MATERIAL
404	4.2	0.00	5.80	5.30	4.30	FINE	0-0.33	GREY-BROWN FINE TO COARSE SAND
							0.00-0.50	BROWN FINE TO COARSE SAND
							0.50-0.80	BROWN PINE SAND
							0.80-2.60	GREY AND DARK GREY FINE TO MEDIUM SAND
							2.60-3.40	DARK GREY SILT-LIKE MATERIAL
							3.40-4.30	GREY FINE TO MEDIUM SAND
477	2.1	0.00	6.40	6.40	5.80	FINE	0-0.33	GREY-BROWN FINE SAND WITH ORGANIC MATTER
							0.00-1.10	DARK GREY TO GREY FINE SAND WITH ORGANIC MATTER
r							1.10-2.70	BROWN FINE TO COARSE SAND
							2.70-3.10	GREY FINE TO COARSE SAND
2							3.10-5.80	LIGHT GREY-BROWN VERY FINE SAND





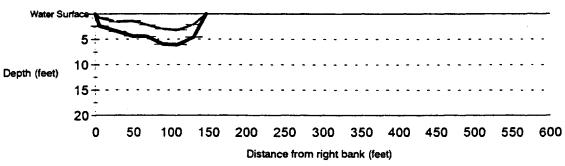




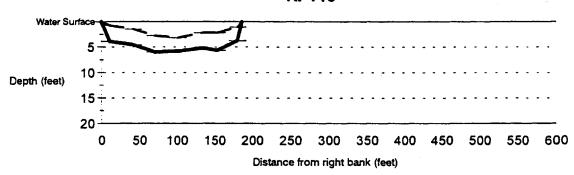




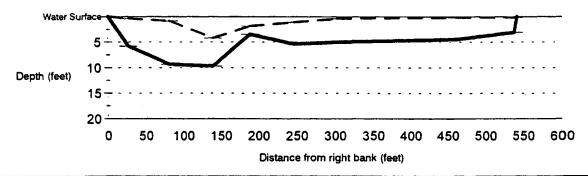




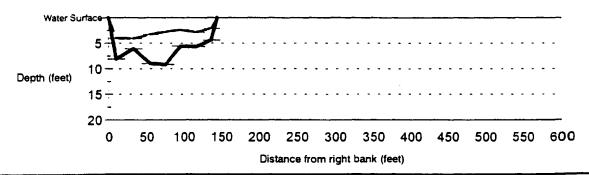
KPT10



KPT11

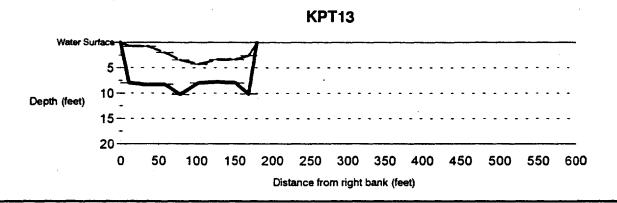


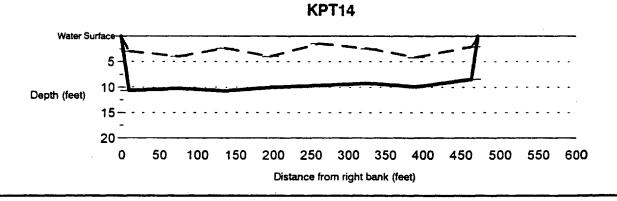
KPT12

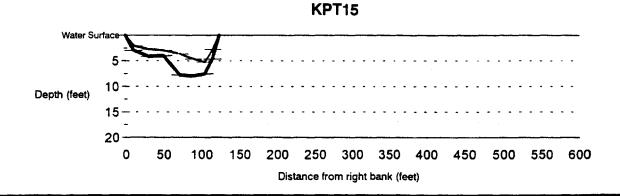


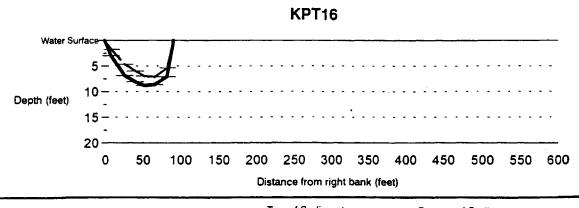
Top of Sediment Bottom of Sediment











Appendix K

Laboratory Reports for Supplemental Investigations

Appendix A

Laboratory Reports for Supplemental Investigations

BLASLAND, BOUCK & LEE, INC.

engineers & scientists

KARLaboratories,Inc.

Blasland, Bouck & Lee, Inc. 6723 Towpath Road, P.O. Box 66 Syracuse, NY 13214-0066

KAR Project No.:

991363

Date Reported: Date Activated: 04/09/99 03/30/99

Date Due:

04/13/99

04/08/99

Kalamazoo, MI 49001

Attn: Ms. Laurie Indick

Date Validated:

Phone 616 381-9666

4425 Manchester Road

Fax 616 381-9698

Project

Description: Analysis of four soil samples from Willow (#645.82.600).

Dear Client,

Your laboratory data is presented to you in this report. All tests were performed within the maximum allowable holding times, have met or exceeded QC requirements and the result represents the sample as it was received - unless otherwise stated under the "Comments" heading.

If you wish to contact us about this work please mention KAR Project No. 991363. To arrange additional sampling or testing please contact our Client Services Department. If you have a question regarding quality assurance please contact William Rauch.

Thank you for the opportunity to serve you. Please do not hesitate to call if we can provide additional assistance.

Respectfully submitted,

Michael J. Jaeger

Director of Laboratories

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LABORATORY REPORT

Client: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991363

04/09/99 Date Reported:

Project Description: Analysis of four soil samples from Willow (#645.82.600).

Sample ID: DWA-SB-14 (12-13'bgs)

Date Received:

3/30/99

Sampled By: RDK of BB&L

Sample Type:

soil

Sample Date : 3/26/99 Sample Time: 1005

KAR Sample No.: 991363-01

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	61.54	% by weight	SM(18) 2540B mod	04/02/99	JMS	
Prep, ECD	Completed		EPA 3545	03/31/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1242	23,000	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1254	3100	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclors, total	26,000	ug/kg dry sample	EPA 8082	04/01/99	MSZ	

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KARLaboratories, Inc.

LABORATORY REPORT

Nient: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991363

Date Reported: 04/09/99

Project Description: Analysis of four soil samples from Willow (#645.82.600).

"W70316" DWA-SB-14 (13-13.8' bgs) Sample ID:

Sampled By: RDK of BB&L

Date Received:

3/30/99

Sample Date : 3/26/99

Sample Type:

soil

Sample Time: 1005

KAR Sample No.: 991363-02

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	68.68	% by weight	SM(18) 2540B mod	04/02/99	JMS	
Prep, ECD	Completed		EPA 3545	03/31/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclors, total	NA NA	1	EPA 8082	04/01/99	MSZ	

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KARLaboratories, Inc.

LABORATORY REPORT

Plient: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991363

Date Reported: 04/09/99

Project Description: Analysis of four soil samples from Willow (#645.82.600).

Sample ID: "W70317" OWA-SB-26 (4.5-6.5) bgs)

Sampled By: RDK of BB&L

Date Received: 3/30/99
Sample Type: soil

Sample Date: 3/30/99

Sample Time: 1030

Sample Type: soil KAR Sample No.: 991363-03

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	67.19	% by weight	SM(18) 2540B mod	04/02/99	JMS	
Prep, ECD	Completed		EPA 3545	03/31/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclors, total	NA NA		EPA 8082	04/01/99	MSZ	

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KARLaboratories, Inc.

Client: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991363

Date Reported: 04/09/99

Project Description: Analysis of four soil samples from Willow (#645.82.600).

Sample ID: "W70318" DWA-5B-26 (6.5-7.0'bgs)

Sampled By: RDK of BB&L

Sample Date: 3/30/99 Sample Time: 1035 Date Received: 3/30/99 Sample Type: soil

KAR Sample No. : 991363-04

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	69.73	% by weight	SM(18) 2540B mod	04/02/99	JMS	
Prep, ECD	Completed		EPA 3545	03/31/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Arocior 1221	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1242	25,000	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1254	4900	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/01/99	MSZ	
PCB Aroclors, total	30,000	ug/kg dry sample	EPA 8082	04/01/99	MSZ	

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KARLaboratories, Inc.

(616) 381-9666

Page 5



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120 PLEI THEND LAB PRICETION

LA E INDICK CLO BLASLAND, BOXX

GTES TOWNATH RO & LEE INC.

PU ROX LICO

SXY CACUSE, DY 13214

PLEASE SEND LAB REPORT TO BRUCE EULIAN Blasland, Boyek & Lee, Inc. C/O GENERAL ELECTRIC CO. 100 WOODLAWN AVE PITTSFIELD, MA 01204

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME Kalamazos	بانا د	ous Bl	no. 0	RAINA	NE WA	1 ARIE	A	ar of	/ //	/ % /	/ /	/ /	/	/	
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	COMP.	GRAB	SA SOLID	MPLE TY WIPE	WATER	Number of Containers	15° 6°						REMARKS
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Relinquished b	y: (Signature)		DATE 23/11	TIME 1702		ed by: (S			Relinq	uished by	: (Signature)	DAT	TE TIA	IE Re	celved by: (Signature)
'nquished b	y: (Signature)	•	DATE	TIME	Receiv (Signatu	ed for L	aborator	y by:	3/30	DATE 1907	2.2	TIME	Rema	arks: 5º	infles	CAR DELIVERED TO BORATORIES

KARLaboratories, Inc.

orginato L

Blasland, Bouck & Lee, Inc. 6723 Towpath Road, P.O. Box 66 Syracuse, NY 13214-0066

KAR Project No.: Date Reported:

991417 04/12/99

Date Activated:

04/02/99

Date Due:

04/16/99

Date Validated:

04/09/99

Attn : *Ms. Laurie Indick*

Project

4425 Manchester Road

Kalamazoo, MI 49001

Phone 616 381-9666

Fax 616 381-9698

Description: Analysis of four soil samples from Willow (#645.82.600).

Dear Client,

Your laboratory data is presented to you in this report. All tests were performed within the maximum allowable holding times, have met or exceeded QC requirements and the result represents the sample as it was received - unless otherwise stated under the "Comments" heading.

If you wish to contact us about this work please mention KAR Project No. 991417. To arrange additional sampling or testing please contact our Client Services Department. If you have a question regarding quality assurance please contact William Rauch.

Thank you for the opportunity to serve you. Please do not hesitate to call if we can provide additional assistance.

Respectfully submitted,

Michael J. Jaeger

Director of Laboratories

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^\ient: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991417

Date Reported: 04/12/99

Project Description: Analysis of four soil samples from Willow (#645.82.600).

"W70319" DWA-5B-38 (4.0-5.1' bgs) Sample ID:

Sampled By:

Sample Date: 3/31/1999 Sample Time: 1110

Date Received: 4/2/1999 Sample Type: soil

KAR Sample No.: 991417-01

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	61.24	% by weight	SM(18) 2540B mod	04/05/99	JMS	
Prep, ECD	Completed		EPA 3545	04/05/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclors, total	NA	7	EPA 8082	04/06/99	MSZ	

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'jent: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991417

Date Reported: 04/12/99

Project Description: Analysis of four soil samples from Willow (#645.82.600).

"W70320" DWA-SB-38(5.1-5.51 bgs) Sample ID:

Sampled By:

Sample Date: 3/31/1999 Sample Time: 1110

Date Received:

4/2/1999

Sample Type:

soil

KAR Sample No.: 991417-02

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	56.00	% by weight	SM(18) 2540B mod	04/05/99	JMS	
Prep, ECD	Completed		EPA 3545	04/05/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1242	22,000	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1248.	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1254	2200	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclors, total	24,000	ug/kg dry sample	EPA 8082	04/06/99	MSZ	

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~ljent: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991417

Date Reported: 04/12/99

Project Description: Analysis of four soil samples from Willow (#645.82.600).

Sample ID:

Sampled By:

"W70321" DWA-5B-51 (7.0-8.01 bgs)

Sample Date: 4/1/1999 Sample Time: 1115

Date Received: 4/2/1999 Sample Type: soil

KAR Sample No.: 991417-03

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	55.85	% by weight	SM(18) 2540B mod	04/05/99	JMS	
Prep, ECD	Completed		EPA 3545	04/05/99	SAS	· · · · · · · · · · · · · · · · · · ·
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1242	23,000	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1254	2600	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclors, total	26,000	ug/kg dry sample	EPA 8082	04/06/99	MSZ	· · · · · · · · · · · · · · · · · · ·

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KARLaboratories, Inc.

(616) 381-9666 Page 4

KAR Project No.: 991417

Date Reported: 04/12/99

Project Description: Analysis of four soil samples from Willow (#645.82.600).

DWA-5B-51 (8.0-9.0'bgs) Sample ID:

Client: Blasland, Bouck & Lee, Inc.

Sampled By:

Sample Date: 4/1/1999 Sample Time: 1130

Date Received: 4/2/1999 Sample Type:

KAR Sample No.: 991417-04

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	67.30	% by weight	SM(18) 2540B mod	04/05/99	JMS	
Prep, ECD	Completed		EPA 3545	04/05/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1242	390	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/06/99	MSZ	
PCB Aroclors, total	390	ug/kg dry sample	EPA 8082	04/06/99	MSZ	

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KARLaboratories, Inc.

(616) 381-9666 Page 5



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120 PLENSE SENCELA EPORTIO

LOURIE INDIC

CLO BLASLANDI, BOCIL-LLEE INC.

G723 TOWATH ROAD

PO BOX 66 NEW YORK 13214-0066

SYKACUSE, NEW YORK 13214-0066

PLEASE SEND LAB REPORT TO:
BRUDE EULIAN
Biasiand, Bouck & Lee, Inc.
C/O GENEBAL ELECTRIC CO.
100 WOODLAWN AVE
PITTSFIELD, MA 01201

CHAIN OF CUSTODY RECORD

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PROJECT NO. いちゃんしい	PROJECT NAME	KALAM GE WIC	L. L.	wie Co LEA	swi Bi	_40.	_		2 2			/ /		/ /	
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	COMP.	GRAB		MPLE TY		Number of Containers		b)/				REMARKS
	NUMBER	<u> </u>				SOLID	WIPE	WATER		1200					<u>/</u>
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KARLaboratories.Inc.

Blasland, Bouck & Lee, Inc. 6723 Towpath Road, P.O. Box 66 Syracuse, NY 13214-0066

KAR Project No. : Date Reported:

991588 04/23/99

Date Activated:

04/09/99

Date Due:

04/23/99

04/23/99

Attn: Ms. Laurie Indick

Date Validated:

Phone 616 381-9666

Kalamazoo, MI 49001

4425 Manchester Road

Fax 616 381-9698

Project

Description: Analysis of six soil samples from Former Lagoon Area (#

645.81.600).

Dear Client,

Your laboratory data is presented to you in this report. All tests were performed within the maximum allowable holding times, have met or exceeded QC requirements and the result represents the sample as it was received - unless otherwise stated under the "Comments" heading.

If you wish to contact us about this work please mention KAR Project No. 991588. To arrange additional sampling or testing please contact our Client Services Department. If you have a question regarding quality assurance please contact William Rauch.

Thank you for the opportunity to serve you. Please do not hesitate to call if we can provide additional assistance.

Respectfully submitted,

Michael J. Jaeger

Director of Laboratories

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ient: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991588

4/9/1999

Date Reported: 04/23/99

Project Description: Analysis of six soil samples from Former Lagoon Area (#645.81.600).

"W70323" FLA-SB-1 (67'-7.7'bgs) Sample ID:

Sampled By: RDK of BB&L

Sample Type:

Date Received:

Sample Date: 4/8/1999 Sample Time: 0905

KAR Sample No.: 991588-01

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	48.49	% by weight	SM(18) 2540B mod	04/14/99	JMS	
Prep, ECD	Completed		EPA 3545	04/15/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclors, total	NA NA		EPA 8082	04/21/99	MSZ	

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KAR Project No.: 991588

Date Reported: 04/23/99

ent: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of six soil samples from Former Lagoon Area (#645.81.600).

"W70324" FLA-SB-5 (2.6-2.9'bgs) Sample ID:

Sampled By: RDK of BB&L

Sample Date: 4/8/1999

Sample Time: 1205

Date Received:

4/9/1999

Sample Type:

soil

KAR Sample No.: 991588-02

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	34.17	% by weight	SM(18) 2540B mod	04/14/99	JMS	
Prep, ECD	Completed		EPA 3545	04/15/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclors, total	NA		EPA 8082	04/21/99	MSZ	

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nt: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991588

Date Reported: 04/23/99

Project Description: Analysis of six soil samples from Former Lagoon Area (#645.81.600).

<u>"W70325"</u> FLA-SB-7 (4-4.7'bgs) Sample ID:

Sampled By: RDK of BB&L

Sample Date: 4/8/1999

Sample Time: 1330

Date Received: 4/9/1999

Sample Type: soil

KAR Sample No.: 991588-03

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	36.16	% by weight	SM(18) 2540B mod	04/14/99	JMS	
Prep, ECD	Completed		EPA 3545	04/15/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1242	24,000	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclors, total	24,000	ug/kg dry sample	EPA 8082	04/21/99	MSZ	

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KAR Project No.: 991588

Date Reported: 04/23/99

ent: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of six soil samples from Former Lagoon Area (#645.81.600).

"W70326" FLA-SB-7 (4.7-5.5'bgs) Sample ID:

Sampled By: RDK of BB&L

Sample Date: 4/8/1999

Sample Time: 1330

Date Received: 4/9/1999

Sample Type: soil KAR Sample No.: 991588-04

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	23.97	% by weight	SM(18) 2540B mod	04/14/99	JMS	
Prep, ECD	Completed		EPA 3545	04/15/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclors, total	NA NA		EPA 8082	04/21/99	MSZ	

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KAR Project No.: 991588

Date Reported: 04/23/99

ent: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of six soil samples from Former Lagoon Area (#645.81.600).

"W70327" FLA-SB-8 (4.8-5.5' bgs) Sample ID:

Sampled By: RDK of BB&L

Sample Date: 4/8/1999

Sample Time: 1445

Date Received:

4/9/1999

Sample Type:

soil KAR Sample No.: 991588-05

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	40.06	% by weight	SM(18) 2540B mod	04/14/99	JMS	
Prep, ECD	Completed		EPA 3545	04/15/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/21/99	MSZ	
PCB Aroclors, total	NA NA		EPA 8082	04/21/99	MSZ	

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lient: Blasland, Bouck & Lee, Inc.

KAR Project No.: 991588

Date Reported: 04/23/99

Project Description: Analysis of six soil samples from Former Lagoon Area (#645.81.600).

Sample ID: "W70328" FLA-SB-11 (6-81 bgs)

Sampled By: RDK of BB&L

Date Received: 4/9/1999
Sample Type: soil

Sample Date: 4/9/1999 Sample Time: 0915

KAR Sample No.: 991588-06

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	64.56	% by weight	SM(18) 2540B mod	04/14/99	JMS	-
Prep, ECD	Completed		EPA 3545	04/15/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	. NA		EPA 8082	04/22/99	MSZ	***************************************

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6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

BLASLANU, BOUCL, MINULES, I'

L JRIE INDICK CO PLEASE SEND LAB REPORT TO:
BRICE EULIAN
Blasland, Bouck & Lee, Inc.
CO GENERAL ELECTRIC CO.

SYRACUSE, NY 13214-000108 WOODLAWN AVE
PITTSFIELD, MA 01201

CHAIN OF CUSTODY RECORD

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PROJECT NO. PI	ROJECT NAME	KALF	YMAZI ČXXVI.	ARE	-ORM -A	EP_			r of	TO A	80 /					
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	сомр.	GRAB	8/	MPLETY	PE	Number of Containers	18						REMARKS
CA 10	NUMBER	DAIL	TIME	COMP.	GAAB	SOLID	WIPE	WATER	20	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	9					
w70323		4/8/99	0905		/				{	V					* 57 Ar 11ME	VDAKO TURN AKUNIO REQUESTED
W70324		413199	1205		V	V			1	V					Mey 未	UDARO TURN ARUNIO REQUESTED IPLES PRESERVED 4°C
W70325		418 99	1330		V	/			1	~						
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Relinquished by:	(Signature)		DATE	TIME	Receive (Signatur	ed for La	borator	y by:		OATE		TIME	Rems LAB	irka: San Wlat w PER_S	OPLES (Deuvered to Kar A BBL employee

12,09

Blasland, Bouck & Lee, Inc. 6723 Towpath Road, P.O. Box 66 Syracuse, NY 13214-0066

Attn: Ms. Laurie Indick

KAR Project No. : 991637 04/26/99 Date Reported:

Date Activated: 04/13/99

Date Due: 04/27/99

Date Validated: 04/23/99

4425 Manchester Road

Kalamazoo, MI 49001

Phone 616 381-9666

Fax 616 381-9698

Project

Description: Analysis of 12 soil samples from Former Lagoon Area (#

645.81.600).

Dear Client,

Your laboratory data is presented to you in this report. All tests were performed within the maximum allowable holding times, have met or exceeded QC requirements and the result represents the sample as it was received - unless otherwise stated under the "Comments" heading.

If you wish to contact us about this work please mention KAR Project No. 991637. To arrange additional sampling or testing please contact our Client Services Department. If you have a question regarding quality assurance please contact William Rauch.

Thank you for the opportunity to serve you. Please do not hesitate to call if we can provide additional assistance.

Respectfully submitted,

Michael J. Jaege

Director of Laboratories

KAR Laboratories, Inc. maintains Full Certification status for Bacteriology, Inorganics, Regulated Organics and Synthetic Organics through USEPA, Michigan Department of Public Health and Indiana State Department of Health. This report may only be reproduced in full and not without the written consent of Blasland, Bouck & Lee, Inc..

KAR Project No.: 991637

Date Reported: 04/26/99

lient: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of 12 soil samples from Former Lagoon Area (#645.81.600).

Sample ID: <u>"W70329"</u> FLA-SB-12 (4-4,8'bgs)

Sampled By: RDK of BB&L

Sample Date: 4/12/99 Sample Time: 1340 Date Received: 4/13/99
Sample Type: soil

KAR Sample No.: 991637-01

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	29.90	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	37,000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	. <330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	37,000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	

Sample ID: "W70330" FLA-SB-12 (4.8-5,916gs)

mpled By: RDK of BB&L

mple Date : 4/12/99

Sample Time: 1340

Date Received: 4/13/99
Sample Type: soil

KAR Sample No.: 991637-02

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	45.62	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	NA		EPA 8082	04/22/99	MSZ	

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KARLaboratories, Inc.

KAR Project No.: 991637

Date Reported: 04/26/99

lient: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of 12 soil samples from Former Lagoon Area (#645.81.600).

<u>"W70331"</u> FLA-SB-13 (4-6'bgs) Sample ID:

Sampled By: RDK of BB&L

Sample Date : 4/12/99

Sample Time: 1410

Date Received:

4/13/99

Sample Type: soil

KAR Sample No.: 991637-03

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	44.10	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	***************************************
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	360	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	. <330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	360	ug/kg dry sample	EPA 8082	04/22/99	MSZ	

"W70332" FLA-SB-16 (4.3-5.8'bgs) Sample ID:

mpled By: RDK of BB&L

mple Date : 4/12/99

Sample Time: 1525

Date Received:

4/13/99

Sample Type:

soil

KAR Sample No.: 991637-04

Test	Resuit	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	42.12	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	NA		EPA 8082	04/22/99	MSZ	

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KARLaboratories, Inc.

KAR Project No.: 991637

Date Reported: 04/26/99

lient: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of 12 soil samples from Former Lagoon Area (#645.81.600).

"W70333" FLA-SB-18 (2-3.1 bgs) Sample ID:

Sampled By: RDK of BB&L Sample Date: 4/12/99

Sample Time: 1605

Date Received: 4/13/99 Sample Type: soil

KAR Sample No.: 991637-05

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	30.08	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	25,000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	······································
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	. <330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	- 110 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
PCB Aroclors, total	25.000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	~~

"W70334" FLA-5B-18 (3.1-3.6'bgs) Sample ID:

ampled By: RDK of BB&L

imple Date : 4/12/99

Date Received: 4/13/99 Sample Type: soil

KAR Sample No.: 991637-06 Sample Time: 1605

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	26.67	% by weight	SM(18) 2540B mod	04/16/99	JMS	· ,
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	6000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	6000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	

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KARLaboratories, Inc.

KAR Project No.: 991637

Date Reported: 04/26/99

ient: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of 12 soil samples from Former Lagoon Area (#645.81.600).

"W70335" FLA-SB-19 (6.3-7'bgs) Sample ID:

Sampled By: RDK of BB&L Sample Date : 4/13/99

Sample Time: 0945

Date Received: Sample Type:

4/13/99

soil

KAR Sample No.: 991637-07

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	47.71	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	NA		EPA 8082	04/22/99	MSZ	

"W70336" FLA-SB-22 (8.3-10 bgs) Sample ID:

mpled By: RDK of BB&L

inple Date: 4/13/99

Sample Time: 1235

Date Received:

4/13/99

Sample Type:

soil

KAR Sample No.: 991637-08

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	43.95	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	NA NA		EPA 8082	04/22/99	MSZ	

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KAR Project No.: 991637

Date Reported: 04/26/99

lient: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of 12 soil samples from Former Lagoon Area (#645.81.600).

Sample ID: "W70337" FLA-SB-22 (8.3-16 bgs) duplicate

Sampled By: RDK of BB&L

Date Received: 4/13/99
Sample Type: soil

Sample Date : 4/13/99 Sample Time : 1235

KAR Sample No.: 991637-09

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	43.15	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	NA	1	EPA 8082	04/22/99	MSZ	

Sample ID: "W70338" FLA-SB-24 (0-2'bgs)

impled By: RDK of BB&L

Date Received: 4/13/99

nple Date : 4/13/99

Sample Type: soil

Sample Time: 1245

KAR Sample No.: 991637-10

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	63.96	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	14,000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	=
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	14,000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	

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KARLaboratories, Inc.

KAR Project No.: 991637

Date Reported: 04/26/99

ient: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of 12 soil samples from Former Lagoon Area (#645.81.600).

"W70339" FLA-SB-24 (2-31 bgs) Sample ID:

Sampled By: RDK of BB&L Date Received: 4/13/99 Sample Type: soil Sample Date : 4/13/99 KAR Sample No.: 991637-11 Sample Time: 1250

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	41.80	% by weight	SM(18) 2540B mod	04/16/99	JMS	,
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	880	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	. <330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Arociors, total	880	ug/kg dry sample	EPA 8082	04/22/99	MSZ	

"W70340" FLA-SB-25 (6.5-7'bgs) Sample ID:

mpled By: RDK of BB&L

Date Received: 4/13/99 mple Date : 4/13/99 Sample Type: soil KAR Sample No.: 991637-12 Sample Time: 1325

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	23.71	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/20/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	NA		EPA 8082	04/22/99	MSZ	

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Blasland, Bouck & Lee, Inc. 6723 Towpath Road, P.O. Box 66 Syracuse, NY 13214-0066

Attn: Ms. Laurie Indick

KAR Project No.: 991665

Date Reported : 04/27/99
Date Activated : 04/14/99

Date Due : 04/28/99

Date Validated: 04/23/99

4425 Manchester Road

Kalamazoo, MI 49001

Phone 616 381-9666

Fax 616 381-9698

Project

Description: Analysis of two soil samples from Former Lagoon Area (#

645.81.600).

Dear Client,

Your laboratory data is presented to you in this report. All tests were performed within the maximum allowable holding times, have met or exceeded QC requirements and the result represents the sample as it was received - unless otherwise stated under the "Comments" heading.

If you wish to contact us about this work please mention KAR Project No. 991665. To arrange additional sampling or testing please contact our Client Services Department. If you have a question regarding quality assurance please contact William Rauch.

Thank you for the opportunity to serve you. Please do not hesitate to call if we can provide additional assistance.

Respectfully submitted,

Michael J. Jaeger

Director of Laboratories

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6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120 LAURIE ENDICK : SEL 6723 DUPATH & J SYRALUS, N.Y. 13214

PLEASE SEND LAB REPORT TO:
BRUCE EULIAN
Blasiand, Bouck & Lee, Inc.
C/O GENERAL EXECTRIC CO.
100 WOODLAWN AVE
PITTSFIELD, MA 01201

CHAIN OF CUSTODY RECORD

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PROJECT NO. 645.81.600	PROJECT NAME KALAMAZOO	forma	r LAG	DN A	RUN				i of		6/	/ /	/ /	/ /	
LAB ID	CUSTODY TAPE NUMBER	DATE	TIME	COMP.	GRAB	SOLID	MPLE TY	WATER	Number of Containers	10 O	P/				REMARKS
W70.329		Hlohn	(340		X	X				X					* STANSKA TEN ALOND TIME ROUSTO. * SAPRES PRESERVE E Y C.
W70330		llam	1310		χ	χ				X					kaista
W70331		4/12/11	1410		X	X				X					* Shiples preserve e 4°C
W70332		4/12/19	1525		X	X	ļ			α					
W70333		17/12/19	1605		X	X				X	ļ				
W70334		4/12/97	1105	ļ	X	X		ļ		X.					
W70335		111	0945		X	X		ļ		X_{-}	<u> </u>				· · · · · · · · · · · · · · · · · · ·
w70336		14/14	1		X	X		ļ	1	<u> </u>		<u> </u>			
<u> </u>		1711	125		X	X			1	X	-				
W70338		湖和	1342		X	X_			1	X—	ļ				
W70339		7777	1320			X		<u> </u>	1	X	<u> </u>				
W70340		7/13/79	1325		\propto	Ύ_	ļ			<u> X</u>		<u> </u>			
7		 					<u> </u>								
Sampled by: (S			DATE	TIME	Receive	ed by: (S	gnature)		Relinquished by: (Signature)))	DAT	E TIME	Received by: (Signature)	
Relinguished b	y: (Signalure)		DATE 41319	TIME 150	Inc	ed by: (S	KUS	1K	Relinq	uished by:	: (Signature	p)	DAT		
Relinquished b			DATE	TIME	Receive (Signatur	od for La	borator	y by:	C	DATE		TIME	Rema	rks: 54m 4 BYL	CADIO RE .

KAR Project No.: 991665 ent: Blasland, Bouck & Lee, Inc.

Date Reported: 04/27/99

Project Description: Analysis of two soil samples from Former Lagoon Area (#645.81.600).

"W70341" DWA-FLA-S3-3 (2-2.8'bgs) Sample ID:

Sampled By: RDK of BBL Sample Date : 4/14/99

Date Received: 4/14/99 Sample Type: soil

Sample Time: 0935

KAR Sample No.: 991665-01

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	ry weight solids 73.88		SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/15/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	3000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	3000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	

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Page 2

KAR Project No.: 991665

Date Reported: 04/27/99

4/14/99

``ient: Blasland, Bouck & Lee, Inc.

Project Description: Analysis of two soil samples from Former Lagoon Area (#645.81.600).

"W70342" DWA-FLA-SB-4 (2-2.51 bgs) Sample ID:

Sampled By: RDK of BBL **Date Received:** Sample Date: 4/14/99 Sample Time: 1020

Sample Type: soil KAR Sample No.: 991665-02

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	59.78	% by weight	SM(18) 2540B mod	04/16/99	JMS	
Prep, ECD	Completed		EPA 3545	04/15/99	SAS	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1248	11,000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	04/22/99	MSZ	
PCB Aroclors, total	11,000	ug/kg dry sample	EPA 8082	04/22/99	MSZ	·-,·

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Page 3

BB BLASLAD, BOUCK & LEE, NO. engineers & scientists

6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120 LAURIC INSICK GO BE 6723 DUPATH ROAD SYRACUSO. N.Y. 13214

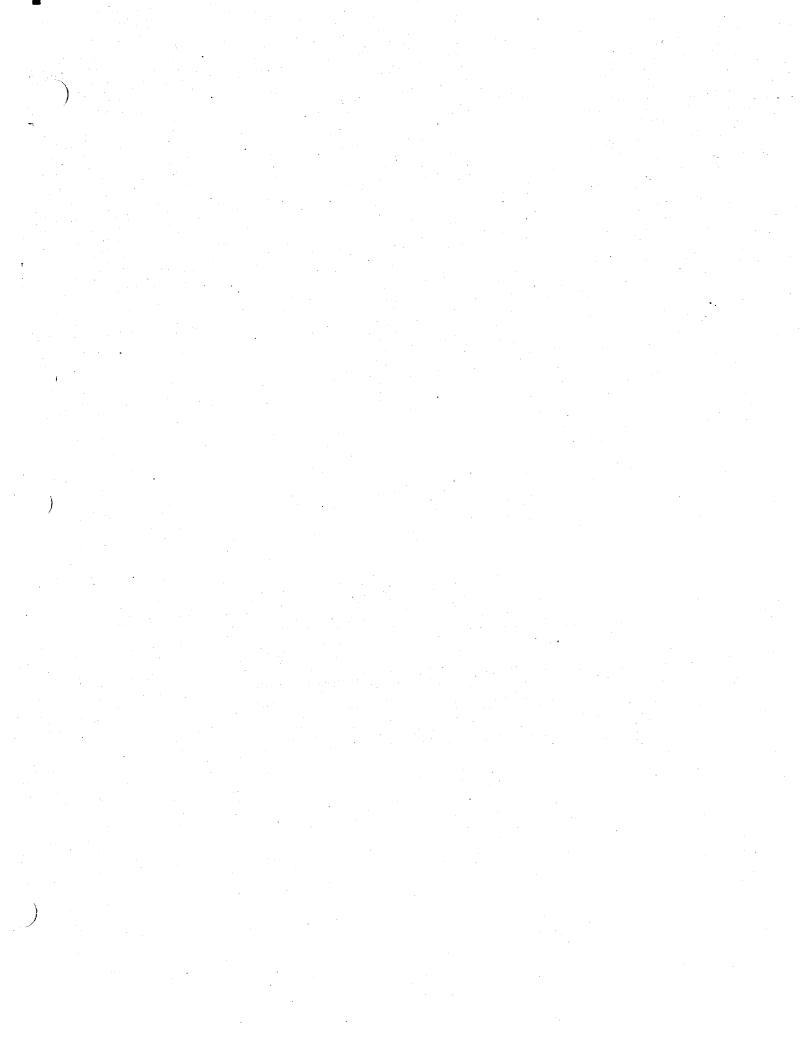
PLEASE SEND LAB REPORT TO:
BRÜDE EULIAN
Blasland, Bouck & Lee, Inc.
C/O GENERAL ELECTRIC CO.
100 WOODLAWN AVE
PITTSFIELD, MA 01201

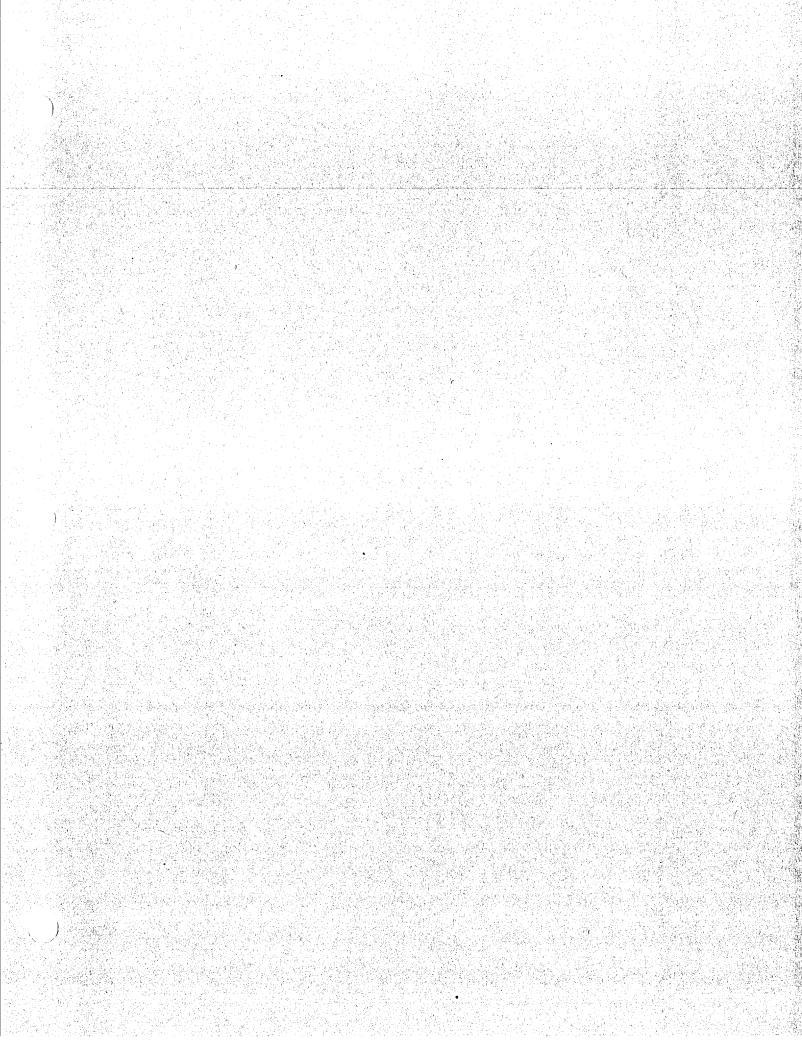
CHAIN OF CUSTODY RECORD

										DY KEC					
PROJECT NO.	PROJECT NAME	_													
65.81.60	KALAMIOO	Form	R CAGO	a) Nu	home				Number of Containers		P /				
	CUSTODY	DATE		COMP.]	SA	MPLETY	PE	ontai		8 P				REMARKS
LAB ID	CUSTODY TAPE NUMBER	DAIL	TIME	COMP.	GRAB	SOLID	WIPE	WATER	ŽÕ	St. O	9 7	/ ,	/ /	/ ,	
WX034/			0935	-	X	X			1	X					* STANDARD TOWN ABOND TOWN
4>0342		4/1/19	1020		X	X				X					* STANDED TO RENDEROND TIME SAMPLES PRESERVED & YOU
															
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Samples by (S	gnapare/ /		DATE	TIME	Receive	ed by: (S	ignature)	<u> </u>	Relinq	lished by:	: (Signature]])	DATE	TIME	E Received by: (Signature)
1 Voy	1140											. 			
Relinquished b	y: (Signature)		DATE 414199	TIME 1335		ed by: (s		11/1	Relinq	uished by:	: (Signature)	DATE	E TIME	Received by: (Signature)
Relinquished b	y: (Signature)		DATE	TIME	Receive (Signatu	ed for La	borator	y by:		ATE		TIME	Remar	ks: SA	LYPPY BY ROX

1 # 75/Lan. 10

9758





DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# KAL082

PCB ANALYSES

WILLOW BLVD.

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:

BBB

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# KAL082 for Willow Blvd. soil sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB analyses. Analyses were performed on the following samples:

			T	Analyses						
Sample ID	Lab ID	Matrix	Sample Date	VOA	BNA	РСВ	TAL	MISC		
W70216	380972	solid	3/23/99			х				
W70217	380973	solid	3/23/99			x				
W70218	380974	solid	3/23/99			x				
W70219	380975	solid	3/23/99			x				
W70220	380976	solid	3/23/99			x				
W70221	380977	solid	3/23/99			х				
W70222	380978	solid	3/23/99			x				
W70223	380979	solid	3/23/99			x				
W70224	380980	solid	3/23/99			х				
W70226	380981	solid	3/23/99			x				
W70226	380982	solid	3/23/99			x				
W70227	380983	solid	3/23/99			x				
W70228	380984	solid	3/23/99			x				
W70229	380985	solid	3/23/99			х				
W70230	380986	solid	3/23/99			x				
W70231*	380987	solid	3/23/99			x				
W70232	380988	solid	3/23/99			×				
W70234	380989	solid	3/23/99			x				
W70235	380990	solid	3/23/99			x				
W70236	380991	solid	3/23/99			×				

MS/MSD analyses performed on sample

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The second secon

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for nonlinearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of soil samples are 10 days from date of receipt to extraction and 40 days to analysis. The technical holding times are 14 days from sample collection to extraction and 40 days to analysis.

All samples were extracted and analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blank. No rinse blanks were submitted with this sample set.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. The percent difference (%D) was within the allowed limit for all continuing calibration check standards, with the following exceptions:

Instrument HP3327 4/9/99 22:40

Aroclor 1248 16.5%

wkal082

Instrument: HP3327 4/9/99 23:04

Aroclor 1254 17.0%

Instrument HP3327 4/10/99 04:41

Aroclor 1260 16.5%

Data for Aroclors 1248, 1254 and 1260 in sample W70218 and data for Aroclor 1248 in sample W70219 have been qualified as estimated based on the deviations. Since none of the listed Aroclors were detected in the remaining samples and since the Aroclor responses were increasing, no additional data have been qualified based on the %D.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Surrogates were diluted beyond the range of detection in the matrix spike and matrix spike duplicate. No data have been qualified based on diluted surrogates. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

The chromatographic pattern for sample W70231 showed a poor match to Aroclor 1221. Data for this Aroclor has been qualified as estimated with presumptive evidence of identification based on the lack of agreement. All other Aroclors have been correctly identified.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. Field Duplicates

No field duplicates were included in this data set.

9. General Comments

The PCB analyses of all samples in this delivery group were subjected to sulfur cleanup, The reporting forms incorrectly indicate that this procedure was not performed.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	<u> </u>		
Are the sample numbers included in the narrative?	<u>X</u>		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	•••••	<u>X</u>	
Holding Times			
Have any holding times been exceeded?		<u> </u>	·.
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x	***	هارورو المستان الرواق المستار الرواق
Were surrogate recoveries outside of specified limits for any sample or blank?		X	
If yes, were the samples reanalyzed?		•	X
Matrix Spikes			
Is there a matrix spike recovery form present?	X	***************************************	
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
_0 out of _6_			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
_0 out of _2_			
Blanks			
Is a Method Blank Summary Form present?	<u> x</u>		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?	*	X	

wkal082

PCB Data Review Checklist - Page 2

	YES	NO	NA_
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u> X</u>		
Aroclor 1221	X		
Aroclor 1232	X		
Aroclor 1242	X		 .
Aroclor 1248	X		
Aroclor 1254	<u> </u>		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X	****	
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u> </u>		
Are %D values for all compounds within limits (less than 15%)?		x	
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			x
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	X	Carried Table, Labor	
Were there any false negatives?		<u> X</u>	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?			x
Compound Quantitation and Reported Detection Limit	<u>s</u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		***************************************
Chromatogram Quality			
Were the baselines stable?	X	•	
Were any electronegative displacement (negative peaks) or unusual peaks detected?		x	
Field Duplicates			
Were field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate **Recovery Summary**

Sample ID	Sample ID Holding Time		ogates
		TCX	DCB
W70216			
W70217			
W70218			
W70219			
W70220			
W70221			
W70222			
W70223			
W70224		<u> </u>	
W70225			
W70226			
W70227			
W70228			
W70229			
W70230			
W70231			
W70232			
W70234			
W70235			
W70236			
W70231MS		D	D
W70231MSD		D	D

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl Qualifiers:

Surrogates diluted out Recovery high Recovery low D

Unless otherwise noted, all parameters are within specified limits.

) wkal082

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/6/99-	4/9/99	4/9/99	4/9/99	4/9/99	4/10/99	4/10/99
Time:	4/7/99	1703	1727	2240	2304	0417	0441
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok						
Aroclor 1221	ok						• .
Aroclor 1232	ok	· · · · · · · · · · · · · · · · · · ·					
Aroclor 1242	ok		ok				
Aroclor 1248	ok	ok		16.5%		ok	
Aroclor 1254	ok				17.0%		
Aroclor 1260	ok						16.5%
Tetrachloro-m-xylene	ok						
Decachlorobiphenyl	ok						
Affected Samples:				W70216	all samples		all samples
·				W70217			
				W70218			
				W70219			
				W70220			
				W70221			
				W70222			
				W70223			
				W70224			
				W70225			
				W70226			
				W70227			
•				W70228			
				W70229			
				W72030			
				W70231			

PCB Calibration Summary - Page 2

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/10/99	4/10/99	4/16/99	4/16/99	4/16/99	4/16/99	
Time;	0954	1018	1735	1759	2312	2336	
	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	
	%D	%D	%D	%D	%D	%D	
Aroclor 1016		_					
Arocior 1221							
Aroclor 1232							
Aroclor 1242		ok		ok			
Aroclor 1248	ok		ok		ok		
Arocior 1254						ok	
Aroclor 1260							
Tetrachloro-m-xylene							<u> </u>
Decachiorobiphenyl		=					
Affected Samples:							

CORRECTED ANALYSIS SUMMARY FORMS

w	70	21	c
•	,, ,		

Lab Name: .	Severn Trent Labora	itories-VT	Lab Code: INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample ID:	380972	·
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
njection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/09/99	
% Solids:	83		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	60	U
11104-28-2	Arocior-1221	60	U
11141-16-5	Aroclor-1232	60	U
63469-21-9	Aroclor-1242	60	U
12672-29-6	Aroclor-1248	60	U
11097-69-1	Aroclor-1254	60	U
11096-82-5	Aroclor-1260	60	U

FORM I AROCLOR ANALYSIS DATA SHEET

			the same	W70217		
Lab Name: Contract:	Severn Trent Labora 99000	itories-VI	Lab Code: <u>INCHVT</u> Case: PCB	SDG:	KAL082	
Phase Type:	SOIL		Lab Sample ID:	380973	7	
Phase Weight:	10.0	(g)	Date Received:	03/25/99		
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99		
Dilution Factor:	1.0	وسيسم	Date Analyzed:	04/09/99		
% Solids:	73		Sulfur Clean-up: _	N		Y/N)
% Solids:	73		Sulfur Clean-up:	N		T/N

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	68	U
11104-28-2	Aroclor-1221	68	บ
11141-16-5	Aroclor-1232	68	U
63469-21-9	Aroclor-1242	68	U
12672-29-6	Aroclor-1248	68	U
11097-69-1	Aroclor-1254	68	U
11096-82-5	Aroclor-1260	68	U

EPA SAMPLE NO.

				VV/UZ18		
Lab Name: 🕹	Severn Trent Labora	tories-VT	Lab Code:INCHVT	L		
Contract:	99000		Case: PCB	SDG:	KAL082	
Phase Type:	SOIL		Lab Sample ID:	380974		
Phase Weight:	10.0	(g)	Date Received:	03/25/99	<u></u>	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99		
Dilution Factor:	1.0		Date Analyzed:	04/09/99		
% Solids:	62	·	Sulfur Clean-up:	N		Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	81	U
11104-28-2	Arocior-1221	81	υ
11141-16-5	Aroclor-1232	81	U
53469-21-9	Aroclor-1242	870	7
12672-29-6	Aroclor-1248	81	U
11097-69-1	Aroclor-1254	56	J
11096-82-5	Arocior-1260	. 75	J

W7	'02	19

Lab Name:	Severn Trent Labora	atories-VT	Lab Code:INCHVT	<u> </u>	
Contract:			Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample l	ID: 380975	
Phase Weight:	10.0	(g)	Date Receive	ed:03/25/99	<u>) </u>
Injection Volume:	1.0	(uL)	Date Extracte	ed: 03/30/99)
Dilution Factor:	1.0		Date Analyze	ed: 04/09/99)
% Solids:	65		Sulfur Clean-u	ıp: <u>N</u>	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	77	. U
11104-28-2	Aroclor-1221	77	U
11141-16-5	Aroclor-1232	77	U
53469-21-9	Arocior-1242	77	U
12672-29-6	Arocior-1248	48	J
11097-69-1	Aroclor-1254	77	U
11096-82-5	Arocior-1260	77	U

EPA SAMPLE NO.

Lab Name:	Severn Trent Labora	ntories-VT	Lab Code:INCHVT		
Contract:	99000	<u> </u>	Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample ID:	380976	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/09/99	
% Solids:	74		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	68	U
11104-28-2	Aroclor-1221	68	U
11141-16-5	Aroclor-1232	68	U
53469-21-9	Aroclor-1242	68	U
12672-29-6	Aroclor-1248	68	U
11097-69-1	Aroclor-1254	68	U
11096-82-5	Aroclor-1260	68	U

W70221

Lab Name:	Severn Trent Labora	atories-VT	Lab Code:INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL082
. Phase Type:	SOIL		Lab Sample ID:	380977	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/09/99	
% Solids:	78	-	Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	64	U
11104-28-2	Aroclor-1221	64	U
11141-16-5	Aroclor-1232	64	U
63469-21-9	Arocior-1242	64	U
12672-29-6	Aroclor-1248	64	U
11097-69-1	Aroclor-1254	64	U
11096-82-5	Aroclor-1260	64.	บ

EPA SAMPLE NO.

Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT	L	
Contract:	99000	· ·	Case:	PCB	SDG:	KAL082
Phase Type:	SOIL		La	ab Sample ID:	380978	
Phase Weight:	10.0	(g)	Da	ate Received:	03/25/99	· · · · · · · · · · · · · · · · · · ·
Injection Volume:	1.0	(uL)	Da	ite Extracted:	03/30/99	
Dilution Factor:	1.0		Da	ate Analyzed:	04/09/99	
% Solids:	73		Sul	fur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	68	U
11104-28-2	Arocior-1221	68	U
11141-16-5	Aroclor-1232	68	U
53469-21-9	Arocior-1242	. 68	U
12672-29-6	Aroclor-1248	68	U
11097-69-1	Aroclor-1254	68	U
11096-82-5	Aroclor-1260	68	U

EPA SAMPLE NO.

f ah Name	Severn Trent Labora	atories-VT	Lab Code: INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample ID:	380979	· ·
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/09/99	
% Solids:	56		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	89	U
11104-28-2	Aroclor-1221	89	U
11141-16-5	Aroclor-1232	89	U
53469-21-9	Arocior-1242	89	U
12672-29-6	Aroclor-1248	89	U
11097-69-1	Aroclor-1254	89	U
11096-82-5	Arocior-1260	89	U

W70	224

A of Manage	Severn Trent Labora	itoriae VT	l ab Oadas	Lab Code: INCHVT		W/0224	
Contract:		itoties-4 i	Lab Code: Case:	PCB	SDG:	KAL082	
Phase Type:	SOIL		L	ab Sample ID:	380980		
Phase Weight:	10.0	(g)	D	ate Received:	03/25/99		
Injection Volume:	1.0	(uL)	D	ate Extracted:	03/30/99		
Dilution Factor:	1.0		D	ate Analyzed:	04/09/99		
% Solids:	87		Su	lfur Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	57	U
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	67	U
63469-21-9	Aroclor-1242	67	U
12672-29-6	Aroclor-1248	. 57	U
11097-69-1	Aroclor-1254	67	U
11096-82-5	Arocior-1260	57	U

FORM 1 **AROCLOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

	W70225
SDG.	KAL082

Lab Name: Severn Trent Laboratories-VT Lab Code: INCHVT 99000 PCB Contract: Case: 380981 SOIL Phase Type: Lab Sample ID: 03/25/99 10.0 (g) Date Received: Phase Weight: 1.0 03/30/99 (uL) Injection Volume: **Date Extracted:** 1.0 04/09/99 **Date Analyzed:** Dilution Factor: 69 Sulfur Clean-up: (Y/N) % Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	72	U
11104-28-2	Aroclor-1221	72	U
11141-16-5	Aroclor-1232	72	U
53469-21-9	Aroclor-1242	72	U
12672-29-6	Aroclor-1248	72	U
11097-69-1	Aroclor-1254	72	U
11096-82-5	Arocior-1260	72	υ

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name:	Severn Trent Labora	tories-VT	Lab Code:INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample ID:	380982	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	69		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	72	U
11104-28-2	Aroclor-1221	72	V
11141-16-5	Aroclor-1232	72	U
534 69-21-9	Aroclor-1242	72	U
12672-29-6	Aroclor-1248	72	U
11097-69-1	Aroclor-1254	72	U
11096-82-5	Aroclor-1260	72	U

t at Names S	evern Trent Labora	utorios VII	Lab Code: INCHVT		, 422,
Contract:	99000	itores-v r	Lab Code: <u>INCHVT</u> Case: <u>PCB</u>	SDG:	KAL082
· Phase Type: _	SOIL		Lab Sample ID:	380983	
Phase Weight: _	10.0	(g)	Date Received:	03/25/99	·
njection Volume: _	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids: _	44		Sulfur Clean-up:	. <u>N</u>	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	110	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	110	U
63469-21-9	Aroclor-1242	110	U
12672-29-6	Aroclor-1248	110	U
11097-69-1	Aroclor-1254	110	U
11096-82-5	Aroclor-1260	110	U

EPA SAMPLE NO.

						4410220	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT		···	
Contract:	99000		Case:	PCB	SDG:	KAL082	
Phase Type:	SOIL		· L	ab Sample ID:	380984		
Phase Weight:	10.0	(g)	D	ate Received:	03/25/99		
injection Volume:	1.0	(uL)	Da	ite Extracted:	03/30/99		ı
Dilution Factor:	1.0		D	ate Analyzed:	04/10/99		
% Solids:	47		Sui	fur Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	110	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	110	U
53469-21-9	Aroclor-1242	110	U
12672-29-6	Aroclor-1248	110	U
11097-69-1	Aroclor-1254	110	U
11096-82-5	Aroclor-1260	110	U

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Lab Name:	Severn Trent Labora	tories-VT	Lab Code:INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample iD:	380985	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	87		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	57	U
11104-28-2	Aroclor-1221	57	U
11141-16-5	Aroclor-1232	57	U
53469-21-9	Aroclor-1242	67	U
12672-29-6	Aroclor-1248	57	U
11097-69-1	Arocior-1254	67	U
11096-82-5	Aroclor-1260	57	U

EPA SAMPLE NO.

				. '	11/0230
Lab Name:	Severn Trent Labora	atories-VT	Lab Code:INCHVT	L	
Contract:	99000		Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample ID:	380986	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0	مسورات المسادر	Date Analyzed:	04/10/99	
% Solids:	89		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER .
12674-11-2	Arocior-1016	56	U
11104-28-2	Arocior-1221	56	U
11141-16-5	Aroclor-1232	56	U
63469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	56	U
11096-82-5	Arocior-1260	56	U

W70231	

Lab Name:	Severn Trent Laborato	ories-VT	Lab Code:INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample ID:	380987	
Phase Weight:	10.0	(g) .	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	70		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	71	U
11104-28-2	Aroclor-1221	61	JN . JN
11141-16-5	Arocior-1232	71	Ü
63469-21-9	Aroclor-1242	71	U
12672-29-6	Aroclor-1248	71	U
11097-69-1	Aroclor-1254	71	U
11096-82-5	Aroclor-1260	71	U

FORM 1 AROCLOR ANALYSIS DATA SHEET

I ah Name: Si	evern Trent Labora	tories-VT	Lab Code:	INCHVT	1	W/U232
Contract:	99000		Case:	РСВ	SDG:	KAL082
Phase Type:	SOIL		Lal	b Sample ID:	380988	
Phase Weight:	10.0	(g)	Dat	te Received:	03/25/99	
Injection Volume: _	1.0	(uL)	Dat	e Extracted:	03/30/99	
Dilution Factor:	1.0		Dat	te Analyzed:	04/10/99	
% Solids: _	71		Sulf	ur Cleaṇ-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	70	U
11104-28-2	Aroclor-1221	70	U
11141-16-5	Aroclor-1232	70	U
63469-21-9	Aroclor-1242	70	U
12672-29-6	Aroclor-1248	70	U
11097-69-1	Aroclor-1254	70	U
11096-82-6	Aroclor-1260	. 70	U

W70234
111000

Lab Name:	Severn Trent Labora	atories-VT	Lab Code: <u>INCHVT</u>		
Contract:	99000		Case: PCB	SDG:	KAL082
Phase Type:	SOIL		Lab Sample ID:	380989	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	70		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	71	U
11104-28-2	Aroclor-1221	71	U
11141-16-5	Aroclor-1232	71	U
53469-21-9 Aroclor-1242		71	U
12672-29-6	Aroclor-1248	71	U
11097-69-1	Aroclor-1254	71	U
11096-82-5	Aroclor-1260	71	U

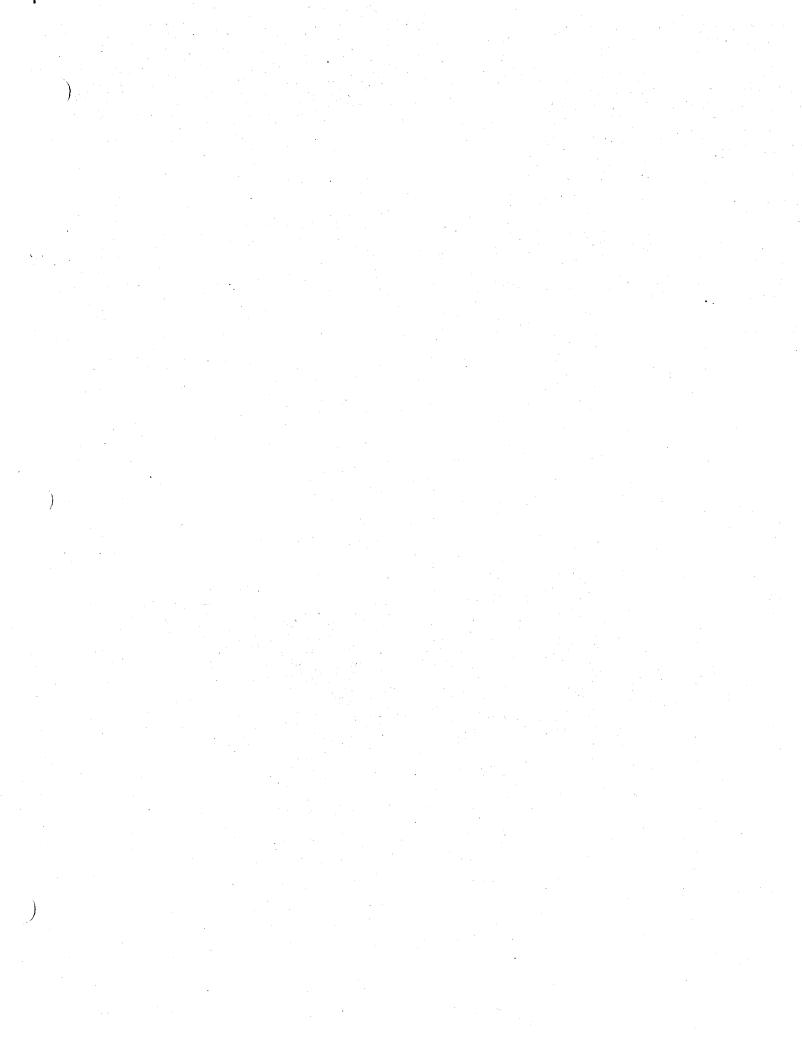
						W70235	
Lab Name:	Severn Trent Labora	atories-VT	_ Lab Code:	INCHVT			
Contract:	99000		Case:	РСВ	SDG:	KAL082	·········
`. Phase Type:	SOIL		La	ab Sample ID:	380990		
Phase Weight:	10.0	(g)	Da	ate Received:	03/25/99	·	
Injection Volume:	1.0	(uL)	Da	te Extracted:	03/30/99		
Dilution Factor:	1.0		Da	nte Analyzed:	04/10/99	·	
% Solids:	47		Sul	fur Clean-up:	N	(Y/N)

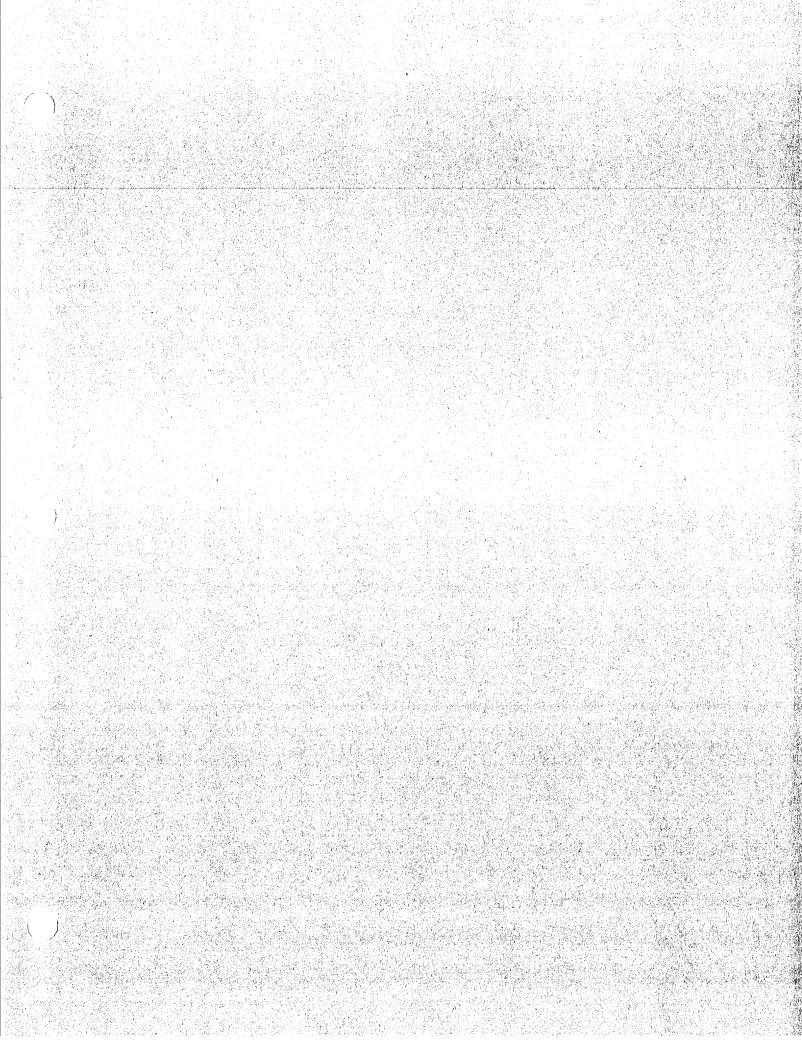
CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	110	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	110	U
53469-21-9 Aroclor-1242		110	U
12672-29-6 Aroclor-1248		110	U
11097-69-1	Aroclor-1254	110	U
11096-82-5	Aroclor-1260	110	U

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Lab Name:	Severn Trent Labora	atories-VT	Lab Code: <u>INCHVT</u>		
Contract	99000		Case: PCB	SDG: K	AL082
Phase Type:	SOIL		Lab Sample ID:	380991	·.
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	54		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	93	U
11104-28-2	Arocior-1221	93	U
11141-16-5	Arocior-1232	93	U
53469-21-9	Arocior-1242	93	U
12672-29-6	Arocior-1248	93	U
11097-69-1	Aroclor-1254	93	U
11096-82-5	Aroclor-1260	93	U





DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# KAL083

PCB ANALYSES

WILLOW BLVD.

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# KAL083 for Willow Blvd. soil sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB analyses. Analyses were performed on the following samples:

					Analyses			
Sample ID	Lab ID	Matrix	Sample Date	VOA	BNA	PCB	TAL	MISC
W70237	380992	solid	3/23/99			х		
W70238	380993	solid	3/23/99			x		
W70239	380994	solid	3/23/99	<u> </u>		x		
W70240	380995	solid	3/23/99			x		
W70241	380996	solid	3/23/99			x		
W70242	380977	solid	3/23/99			х		
W70243	380998	solid	3/23/99			x		
W70244	380999	solid	3/23/99			х		
W70245*	381000	solid	3/23/99			х		
W70246	381001	solid	3/23/99			x		
W70248	381002	solid	3/23/99			х		
W70249	381003	solid	3/23/99			х		
W70250	381004	solid	3/23/99			х		
W70251	381005	solid	3/23/99			x		
W70252	381006	solid	3/23/99			×		
W70253	381007	solid	3/23/99			x		
W70254	381008	solid	3/23/99			x		
W70255	381009	solid	3/23/99			×		
W70256	381010	solid	3/23/99			х		
W70257	381011	solid	3/23/99			x		

MS/MSD analyses performed on sample

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for nonlinearity at the low end of the calibration curve.

<u>Identification</u>

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of soil samples are 10 days from receipt to extraction and 40 days to analysis. The technical holding times are 14 days from sample collection to extraction and 40 days to analysis.

All samples were extracted and analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blank. No rinse blanks were submitted with this sample set.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. The percent difference (%D) for all continuing calibration check standards were within the allowed limit, with the following exception:

Instrument HP3327

4/10/99 04:41

Aroclor 1260 16.5%

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Aroclor 1260 data for samples W70239 and W70251 have been qualified as estimate based on the deviation. Since no Aroclor 1260 was detected in the remaining samples and since the Aroclor response was increasing, no additional data have been qualified based on the %D.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Surrogates were diluted beyond the range of detection in the matrix spike and matrix spike duplicate. No data have been qualified based on diluted surrogates. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. Field Duplicates

No field duplicates were included in this data set.

9. General Comments

The PCB analyses of all samples in this delivery group were subjected to sulfur cleanup, The reporting forms incorrectly indicate that this procedure was not performed.

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- 10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		<u> </u>	· .
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x	-	
Were surrogate recoveries outside of specified limits for any sample or blank?	وساني بساخا سادا السواحات	x	
If yes, were the samples reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	X	***	
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>Blanks</u>			
is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/reagent/instrument blanks have positive results?		x	
Do any field/rinse blanks have positive results?		-	X
Are there field/rinse/equipment blanks associated with every sample?		<u>X</u>	

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PCB Data Review Checklist - Page 2

	YES	NO	NA
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	<u> </u>		
Aroclor 1242	<u> </u>		·
Aroclor 1248	<u> </u>		
Aroclor 1254	<u> </u>		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	x		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	x		
Are %D values for all compounds within limits (less than 15%)?		X	
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	<u>x</u>	-	
Were there any false negatives?		<u>X</u>	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Lim	its		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	<u> </u>		
Were any electronegative displacement (negative peaks or unusual peaks detected?	s)	X	
Field Duplicates			
Were field duplicates submitted with the samples?		<u> x</u>	

PCB Holding Time and Surrogate **Recovery Summary**

Sample ID	Holding Time	Surrogates		
		TCX	DCB	
W70237				
W70238			······································	
W70239				
W70240				
W70241			•	
W70242			· · · · · · · · · · · · · · · · · · ·	
W70243				
W70244				
W70245				
W70246				
W70248				
W70249				
W70250				
W70251				
W70252				
W70253				
W70254				
W70255				
W70257				
W70256				
W70245MS		D	D	
W70245MSD		D	D	

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out

Recovery high Recovery low 1

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/6/99-	4/10/99	4/10/99	4/10/99	4/10/99	4/10/99	4/10/99
Time:	4/7/99	0417	0441	0951	1018	1531	1555
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok						
Aroclor 1221	ok						
Aroclor 1232	ok				ü		
Aroclor 1242	ok				ok		
Aroclor 1248	ok	ok		ok		ok	
Aroclor 1254	ok						ok
Aroclor 1260	ok		16.5%				
Tetrachioro-m-xylene	ok						
Decachiorobiphenyl	ok						
Affected Samples:			all samples				
		<u> </u>					
						:	
		·					
•							
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PCB Calibration Summary - Page 2

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/10/99	4/10/99	4/16/99	4/16/99	4/16/99	4/16/99	
Time:	2108	2132	1735	1759	2312	2336	
	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	
	%D	%D	%D	%D	%D	%D	
Aroclor 1016							
Aroclor 1221		···-					
Aroclor 1232							
Aroclor 1242				ok			
Aroclor 1248	ok		ok		ok		
Aroclor 1254						ok	
Arocior 1260		ok					
Tetrachloro-m-xylene			<u> </u>				
Decachlorobiphenyl			<u></u>		! 		
Affected Samples:							
		 	<u></u>				

CORRECTED ANALYSIS SUMMARY FORMS

EPA	SA	MP	LE	NO
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				W70237	
Lab Name:	Severn Trent Laborato	ries-VT	Lab Code: <u>INCHVT</u>	<u> </u>	
Contract:	99000		Case: PCB	SDG: KALO	83
Phase Type:	SOIL		Lab Sample ID:	380992	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	82		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	61	U
11104-28-2	Arocior-1221	61	U
11141-16-5	Aroclor-1232	61	U
63469-21-9	Aroclor-1242	. 61	U
12672-29-6	Aroclor-1248	61	U
11097-69-1	Arocior-1254	61	U
11096-82-5	Arocior-1260	61	U

Lab Namas San	vern Trent Labora	itories.VT	Lab Code: INCHVT		W70238
Contract:	99000	TOHES-Y I	Case: PCB	SDG:	KAL083
Phase Type:	SOIL		Lab Sample ID:	380993	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
jection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids	92		Sulfur Clean-un:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	54	U
11104-28-2	Arocior-1221	54	U
11141-16-5	Aroclor-1232	54	U
63469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	บ
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	54	U

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W7	UZ.	J

Lab Name: S	evern Trent Labora	itories-VT	Lab Code: _	INCHVT	<u></u> _	
Contract:	99000	_	Case: _	РСВ	SDG:	KAL083
Phase Type: _	SOIL		Lai	b Sample ID:	380994	
Phase Weight: _	10.0	(g)	Da	ite Received:	03/25/99	
njection Volume:	1.0	(uL)	Đat	te Extracted:	03/30/99	
Dilution Factor:	1.0	-	. Da	te Analyzed:	04/10/99	
% Solids: _	79		Sulf	fur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER	
12674-11-2	Aroclor-1016	63	U	
11104-28-2	Aroclor-1221	63	U	
11141-16-5	Aroclor-1232	63	U	
53469-21-9	Aroclor-1242	63	U	
12672-29-6	Aroclor-1248	63	U	
11097-69-1	Aroclor-1254	63	U	
11096-82-5	Aroclor-1260	170	7	

EPA SAMPLE NO.

		W70240	
_	SDG:	KAL083	

Lab Name: Severn Trent Laboratories-VT Lab Code: INCHVT 99000 **PCB** Contract: Case: SOIL 380995 Lab Sample ID: Phase Type: 03/25/99 10.0 Phase Weight: (g) **Date Received:** 1.0 03/30/99 (uL) Date Extracted: Injection Volume: 1.0 04/10/99 **Dilution Factor:** Date Analyzed: 69 N (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	72	U
11104-28-2	Aroclor-1221	72	U
11141-16-5	Aroclor-1232	72	U
53469-21-9	Aroclor-1242	72	U
12672-29-6	Arocior-1248	72	U
11097-69-1	Aroclor-1254	72	U
11096-82-5	Aroclor-1260	72	U

						W70241	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT	L		
Contract:	99000		Case: _	PCB	SDG:	KAL083	
Phase Type:	SOIL.		La	ab Sample ID:	380996	·	
Phase Weight:	10.0	(g)	Da	ate Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	nte Extracted:	03/30/99		
Dilution Factor:	1.0		Da	ate Analyzed:	04/10/99		
% Solids:	50		Sul	fur Clean-up:	N		(/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	100	U
11104-28-2	Arocior-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Arocior-1242	100	U
12672-29-6	Aroclor-1248	100	U
11097-69-1	Aroclor-1254	100	U
11096-82-5	Arocior-1260	100	U

EPA SAMPLE NO.

04/10/99

N

(Y/N)

						W70242	
Lab Name:	Severn Trent Laboratorie	s-VT	Lab Code: .	INCHVT	L		
Contract:	99000		Case:	PCB	SDG: _	KAL083	<u></u>
Phase Type:	SOIL		La	b Sample ID:	380997		
Phase Weight:	10.0	(g)	Da	ite Received:	03/25/99)	
Injection Volume:	1.0	(uL)	Da	te Extracted:	03/30/99	i	

1.0

82

Dilution Factor:

% Solids:

CAS NO.	COMPOUND	IPOUND CONCENTRATION ug/Kg	
12674-11-2	Aroclor-1016	61	U
11104-28-2	Arocior-1221	61	U
11141-16-5	Aroclor-1232	61	U
534 69 - 21-9	Aroclor-1242	61	U
12672-29-6	Aroclor-1248	61	U
11097-69-1	Aroclor-1254	61	U
11096-82-5	Aroclor-1260	61	U

Date Analyzed:

Sulfur Clean-up:

						W/UZ43	
Lab Name:	Severn Trent Laborat	ories-VT	Lab Code:	INCHVT			j
Contract:	99000		Case: _	PCB	SDG:	KAL083	-
Phase Type:	SOIL	-	La	b Sample ID:	380998		
Phase Weight:	10.0	(g)	Da	ite Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	te Extracted:	03/30/99		
Dilution Factor:	1.0		Da	ite Analyzed:	04/10/99	·····	
% Solids:	87		Sui	fur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	57	U
11104-28-2	Aroclor-1221	57	U
11141-16-5	Arocior-1232	57	U
53469-21-9	Arocior-1242	. 67	υ
12672-29-6	Arocior-1248	57	U
11097-69-1	Aroclor-1254	57	U
11096-82-5	Aroclor-1260	67	U

	over Trent I above	storice VT	Lab Gode: INCHVT	,	W70244
Lab Name: <u>의</u>	evern Trent Labora	IfOHE2-A I	Lab Code:INCHVT		
Contract:	99000		Case: PCB	_ SDG:	KAL083
Phase Type: _	SOIL		Lab Sample ID:	380999	
Phase Weight: _	10.0	(g)	Date Received:	03/25/99	
njection Volume: _	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids: _	91		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	65	U
11104-28-2	Aroclor-1221	55	υ
11141-16-6	Aroclor-1232	55	U
53469-21-9	Aroclor-1242	65	U
12672-29-6	Arocior-1248	55	U
11097-69-1	Aroclor-1254	55	U
11096-82-5	Aroclor-1260	65	U

				V	N70245
Lab Name:	Severn Trent Labora	tories-VT	Lab Code: INCHVT	<u> </u>	
Contract:	99000		Case: PCB	SDG:	KAL083
Phase Type:	SOIL		Lab Sample ID:	381000	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	77		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	65	U
11104-28-2	Aroclor-1221	65	U
11141-16-5	Aroclor-1232	65	U
63469-21-9	Aroclor-1242	65	U
12672-29-6	Aroclor-1248	65	U
11097-69-1	Aroclor-1254	65	U
11096-82-5	Aroclor-1260	65	U

EPA SAMPLE N	10.
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04/10/99

(Y/N)

Lab Name:	Severn Trent Labor	atories-VT	Lab Code: INCHVT	W70246	
Contract:	99000		Case: PCB	SDG: KAL083	
hase Type:	SOIL		Lab Sample ID:	381001	
se Weight:	10.0	(g)	Date Received:	03/25/99	
on Volume:	1.0	(uL)	Date Extracted:	03/30/99	

Date Analyzed:

Sulfur Clean-up:

1.0

74

Phase Type: Phase Weight: Injection Volume:

Dilution Factor:

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	68	U
11104-28-2	Aroclor-1221	68	U
11141-16-5	Aroclor-1232	68	U
63469-21-9	Arocior-1242	68	U
12672-29-6	Arocior-1248	. 68	U
11097-69-1	Aroclor-1254	68	U
11096-82-5	Aroclor-1260	68	U

EPA SAMPLE NO.

04/10/99

(Y/N)

					W70248
Lab Name: S	Severn Trent Laboratories	-VT	Lab Code:INCHVT	L	
Contract:	99000		Case: PCB	SDG:	KAL083
Phase Type:	SOIL		Lab Sample ID:	381002	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	

1.0

40

Dilution Factor:

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	120	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	120	U
63469-21-9	Arocior-1242	120	U
12672-29-6	Arocior-1248	120	U
11097-69-1	Aroclor-1254	120	U
11096-82-5	Arocior-1260	120	U

Date Analyzed:

Sulfur Clean-up:

t at Alamas Se	vern Trent Labora	stories VT	Lab Code: INCHVT		W70249
	99000	notice-4 (KAL083
· Contract:	33000		Case: PCB	SDG:	LYALUGS
Phase Type:	SOIL		Lab Sample ID:	381003	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
jection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	43		Sulfur Clean-up:	Ν .	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	120	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	120	U
53469-21-9	Aroclor-1242	120	U
12672-29-6	Arocior-1248	120	U
11097-69-1	Aroclor-1254	120	U
11096-82-5	Aroclor-1260	120	U

EPA SAMPLE NO.

W70250

Lab Name:	Severn Trent Labora	tories-VT	Lab Code: INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL083
Phase Type:	SOIL	,	Lab Sample ID:	381004	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	81		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	62	U
11104-28-2	Aroclor-1221	62	U
11141-16-5	Arocior-1232	62	U
53469-21 - 9	Aroclor-1242	62	U
12672-29-6	Aroclor-1248	62	U
11097-69-1	Aroclor-1254	62	U
11096-82-5	Aroclor-1260	62	U

EPA	SAI	MPL	E N	0
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						W70251	
Lab Name: Se	vern Trent Labora	tories-VT	Lab Code:INC	HVT		·	
Contract:	99000		Case: F	CB	SDG:	KAL083	
Phase Type:	SOIL		Lab San	nple ID:	381005		,
Phase Weight:	10.0	(g)	Date Re	ceived:	03/25/99		
jection Volume:	1.0	(uL)	Date Ext	racted:	03/30/99		
Dilution Factor:	1.0		Date An	alyzed:	04/10/99		
% Solids:	90		Sulfur Cle	ean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	56	U
11104-28-2	Arocior-1221	56	U
11141-16-5	Arocior-1232	56	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Arocior-1254	56	U
11096-82-5	Arocior-1260	140	

Lab Code:

Case:

EPA SAMPLE NO.

INCHVT	W70252				
INCHAI	L	-			
PCB	SDG: _	KAL083			
ab Sample ID:	381006				
ate Received:	03/25/9	<u> </u>			

CO!!			204000	
SUIL		Lab Sample ID:	29,1000	
10.0	(g)	Date Received:	03/25/99	
1.0	(uL)	Date Extracted:	03/30/99	
1.0		Date Analyzed:	04/10/99	
87		Sulfur Clean-up:	N	(Y/N)
	1.0	10.0 (g) 1.0 (uL) 1.0	10.0 (g) Date Received: 1.0 (ul.) Date Extracted: 1.0 Date Analyzed:	10.0 (g) Date Received: 03/25/99 1.0 (uL) Date Extracted: 03/30/99 1.0 Date Analyzed: 04/10/99

Lab Name: Severn Trent Laboratories-VT

Contract:

99000

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	57	U
11104-28-2	Aroclor-1221	57	U
11141-16-5	Arocior-1232	57	U
53469-21- 9	Aroclor-1242	57	U
12672-29-6	Aroclor-1248	57	U
11097-69-1	Aroclor-1254	57	U
11096-82-5	Arocior-1260	57	U

W70253	
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Lab Name:	Severn Trent Labora	tories-VT	Lab Code: _	INCHVT			
Contract:	99000		Case: _	РСВ	SDG:	KAL083	
Phase Type:	SOIL		Lai	b Sample ID: _	381007		
Phase Weight:	10.0	(g)	Da	te Received: _	03/25/99		
Injection Volume:	1.0	(uL)	Dat	e Extracted:	03/30/99		
Dilution Factor:	1.0		Da	te Analyzed:	04/10/99		
% Solids:	88		Sulf	ur Clean-up:	N	(Y/N)	ļ
				-			

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	67	U
11104-28-2	Aroclor-1221	57	U
11141-16-6	Aroclor-1232	57	U
63469-21-9	Aroclor-1242	57	U
12672-29-6	Aroclor-1248	57	U
11097-69-1	Aroclor-1254	57	U
11096-82-5	Aroclor-1260	57	U

				W70254	•
Lab Name:	Severn Trent Labora	tories-VT	Lab Code: INCHVT		
Contract:	99000		Case: PCB	SDG: KALO	83
Phase Type:	SOIL		Lab Sample ID:	381008	·
Phase Weight:	10.0	(g)	Date Received: _	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/10/99	
% Solids:	86		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	58	U
11104-28-2	Aroclor-1221	58	U
11141-16-5	Arocior-1232	58	U
63469-21-9	Aroclor-1242	58	U
12672-29-6	Aroclor-1248	58	U
11097-69-1	Arocior-1254	58	U
11096-82-5	Aroclor-1260	58	U

						W70255	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT	L		
Contract:	99000		Case:	PCB	SDG:	KAL083	
Phase Type:	SOIL		L	ab Sample ID:	381009		
Phase Weight:	10.0	(g)	D	ate Received:	03/25/99		
injection Volume:	1.0	(uL)	Da	ate Extracted:	03/30/99	···	
Dilution Factor:	1.0		D	ate Analyzed:	04/10/99		
% Solids:	88		Sul	ifur Clean-up:	N	(Y/	/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER	
12674-11-2	Aroclor-1016	67	U	
11104-28-2	Aroclor-1221	57	, υ	
11141-16-5	Aroclor-1232	57	U	
53469-21-9	Aroclor-1242	57	U	
12672-29-6	Aroclor-1248	. 57	U	
11097-69-1	Aroclor-1254	57	U	
11096-82-5	Arocior-1260	57	υ	

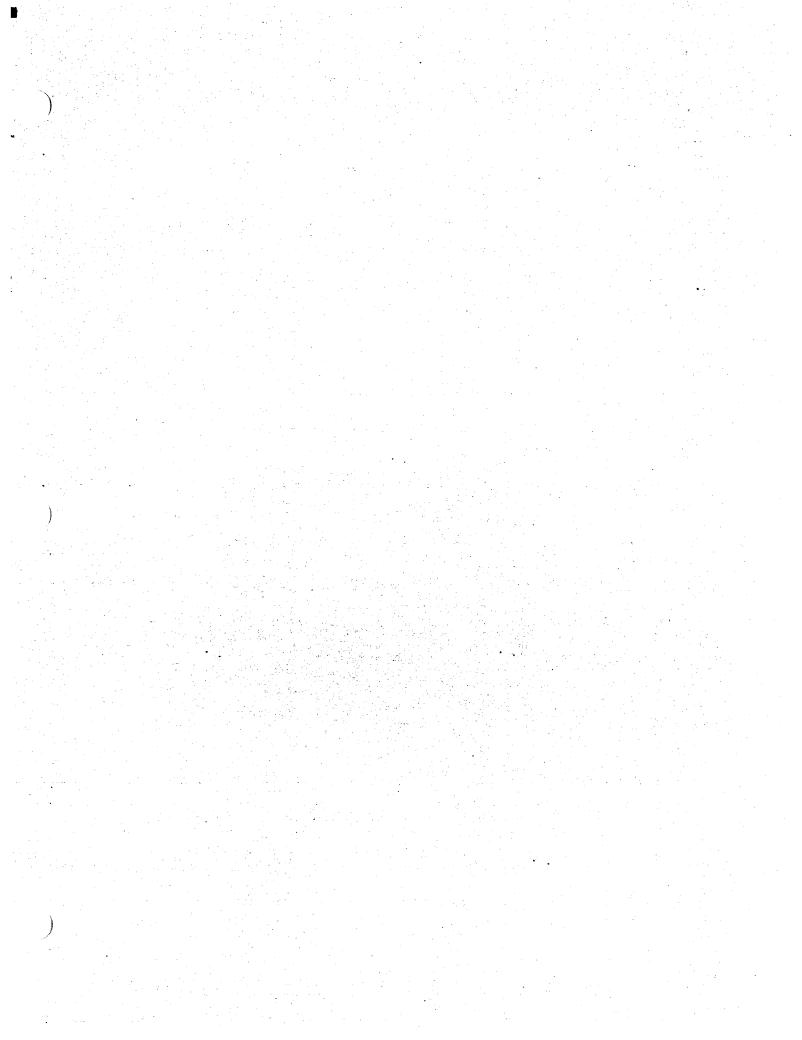
I sh Nama: Sf	evern Trent Labora	tories.VT	Lab Code: INCHVT		W70256		
Contract:	99000		Case: PCB	SDG:	KAL083		
Phase Type:	SOIL		Lab Sample iD:	381010			
Phase Weight:	10.0	(g)	Date Received:	03/25/99			
jection Volume: _	1.0	(uL)	Date Extracted:	03/30/99			
Dilution Factor: _	1.0		Date Analyzed: _	04/10/99			
% Solids:	77		Sulfur Clean-up:	N	(Y/N)		

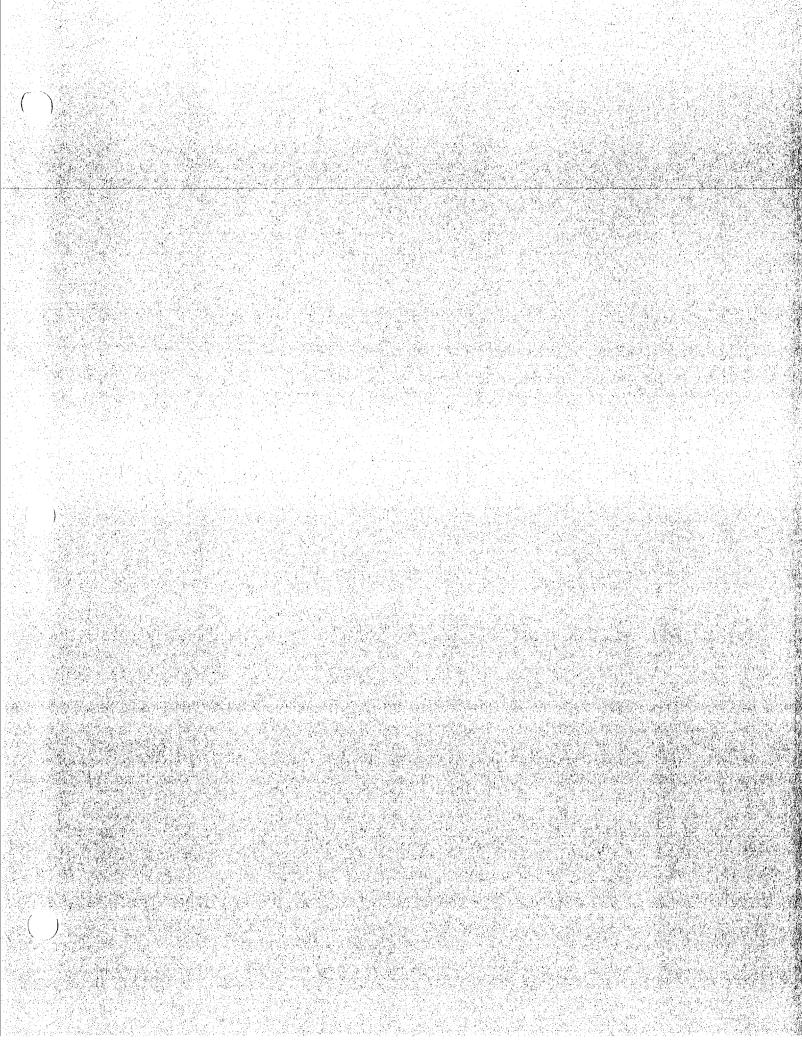
CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	65	U
11104-28-2	Arocior-1221	65	U
11141-16-6	Aroclor-1232	65	U
63469-21-9	Aroclor-1242	65	U
12672-29-6	Aroclor-1248	210	
11097-69-1	Arocior-1254	33	J
11096-82-5	Aroclor-1260	65	U

		W70257			
	SDG:	KAL083			
D:	381011				
		-			

Lab Name: Se	evern Trent Labora	atories-VT	Lab Code: <u>INCHVT</u>	L	
Contract:	99000		Case: PCB	SDG:	KAL083
Phase Type: _	SOIL		Lab Sample ID: _	381011	
Phase Weight: _	10.0	(g)	Date Received: _	03/25/99	<u>,</u>
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0	<u>·</u>	Date Analyzed:	04/10/99	·····
% Solids: _	32		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER	
12674-11-2	Aroclor-1016	160	U	
11104-28-2	Aroclor-1221	160	υ	
11141-16-5	Aroclor-1232	160	υ	
53469-21-9	Aroclor-1242	160	U	
12672-29-6	Aroclor-1248	160	U	
11097-69-1	Aroclor-1254	160	U	
11096-82-5	Arocior-1260	160	U	





DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# KAL084

PCB ANALYSES

WILLOW BLVD.

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:

BIASIAND, BOUCK & LEE, INC.
engineers & scientists

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# KAL084 for Willow Blvd. soil sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB analyses. Analyses were performed on the following samples:

Sample 1D	Lab ID	Matrix			Analyses			
			Sample Date	VOA	BNA	РСВ	TAL	MISC
W70258	381012	solid	3/23/99			х	-	
W70259	381013	solid	3/23/99	<u> </u>		x		
W70260	381014	solid	3/23/99			_ x		
W70261	381015	solid	3/23/99			. x		
W70262*	381016	solid	3/23/99			×		
W70263	381017	solid	3/23/99			×		
W70265	381018	solid	3/23/99			×		
W70266	381019	solid	3/24/99			×		
W70267	381020	solid	3/24/99			x		
W70268	381021	solid	3/24/99			×		
W70269	381022	solid	3/24/99			x		
W70270	381023	solid	3/24/99			×		
W70271	381024	solid	3/24/99			×		
W70272	381025	solid	3/24/99			×		
W70273	381026	solid	3/24/99	1		x		
W70274	381027	solid	3/24/99	1		×		
W70275	381028	solid	3/24/99	1		x		
W70276	381029	solid	3/24/99			×		
W70277	381030	solid	3/24/99	1		×		
W70278	381031	solid	3/24/99	1		×		
			0,24,00	1		-		

MS/MSD analyses performed on sample

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of soil samples are 10 days from receipt to extraction and 40 days to analysis. The technical holding times are 14 days from sample collection to extraction and 40 days to analysis.

All samples were extracted and analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method or rinse blanks.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

wkal084

Recovery for one surrogate was below control limits in sample W70265. Since recovery for the remaining surrogate was within control limits, no data have been qualified based on the deviation. Surrogates were diluted beyond the range of detection in samples W70270, W70274, W70275, W70276, W70262MS and W70262MSD. No data have been qualified based on diluted surrogates. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. Field Duplicates

No field duplicates were included in this data set.

9. General Comments

The PCB analyses of all samples in this delivery group were subjected to sulfur cleanup, The reporting forms incorrectly indicate that this procedure was not performed.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

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DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Were surrogate recoveries outside of specified limits for any sample or blank?	x	•	
If yes, were the samples reanalyzed?		X	
Matrix Spikes	•		
Is there a matrix spike recovery form present?	X		·
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
0_ out of12			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	_x_		
Do any method/reagent/instrument blanks have positive results?		<u> </u>	
Do any field/rinse blanks have positive results?		<u> </u>	
Are there field/rinse/equipment blanks associated with every sample?	<u>X</u>		

PCB Data Review Checklist - Page 2

	YES	NO	NA_
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	X		
Aroclor 1242	X		<u> </u>
Aroclor 1248	<u> </u>		
Aroclor 1254	<u> </u>		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	x		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	x	· · · · · · · · · · · · · · · · · · ·	
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			x
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	x		
Do the combined column and individual column Aroclor identifications agree?	x	****	
Were there any false negatives?		<u> </u>	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limi	<u>ts</u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		•
Chromatogram Quality			
Were the baselines stable?	X	-	
Were any electronegative displacement (negative peaks or unusual peaks detected?)	X	• .
Field Duplicates			
Were field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates		
		TCX		
W70258				
W70259				
W70260				
W70261				
W70262				
W70263				
W70265		!		
W70266				
W70267				
W70268				
W70269				
W70270		D	D	
W70271				
W70272				
W70273	····			
W70274	······	D	D	
W70275	· · · · · · · · · · · · · · · · · · ·	D	D	
W70276		D	D	
W70277				
W70278				
W70262MS		D	D	
W70262MSD		D	D	
	·			

Surrogate Standards
TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:

Surrogates diluted out Recovery high Recovery low D

Unless otherwise noted, all parameters are within specified limits.

wkal084

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/6/99-	4/16/99	4/16/99	4/16/99	4/16/99	4/17/99	4/17/99
Time:	4/7/99	1735	1759	2312	2336	0450	0514
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal	Cont. Cal	Cont. Cal.	Cont. Cal.
<u> </u>	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok						
Aroclor 1221	ok			·			
Aroclor 1232	ok						
Arocior 1242	ok		ok				
Aroclor 1248	ok	ok		ok		ok	
Aroclor 1254	ok				ok		
Aroclor 1260	ok						ok
Tetrachloro-m-xylene	ok						
Decachlorobiphenyl	ok						
Affected Samples:							

PCB Calibration Summary - Page 2

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/17/99	4/17/99	4/17/99	4/17/99		
Time:	1003	1027	1453	1517		
	Gont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal		
	%D	%D	%D	%D		
Aroclor 1016			ļ!			
Aroclor 1221	1					
Aroclor 1232		ļ				
Aroclor 1242		ok				
Aroclor 1248	ok		ok			
Aroclor 1254		ļ		ok		
Aroclor 1260						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:					 	
			1			

CORRECTED ANALYSIS SUMMARY FORMS

EPA	SA	MΡ	LE	NO.
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W70258

						W/U258	
Lab Name:	Severn Trent Labora	itories-V i	Lab Code: _	INCHVT	<u> </u>		
Contract:	99000	···	Case: _	PCB	SDG:	KAL084	
Phase Type:	SOIL	-	Lai	b Sample ID:	381012		
Phase Weight:	10.0	(g)	Da	te Received:	03/25/99		
Injection Volume:	1.0	(uL)	Dat	e Extracted:	03/30/99		
Dilution Factor:	1.0		Da	te Analyzed:	04/16/99		
% Solids:	77		Sulf	ur Clean-up:	N	((Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	65	U
11104-28-2	Arocior-1221	65	U
11141-16-5	Aroclor-1232	65	U
53469-21 -9	Aroclor-1242	65	U
12672-29-6	Aroclor-1248	65	U
11097-69-1	Aroclor-1254	65	U
11096-82-5	Aroclor-1260	65	U

W70259

				w w	70259
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL084
Phase Type:	SOIL		Lab Sample ID:	381013	————————————————————————————————————
Phase Weight:	10.0	(g)	Date Received: _	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed: _	04/17/99	
% Solids:	86		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	58	U
11104-28-2	Aroclor-1221	58	U
11141-16-5	Aroclor-1232	58 -	U
534 69-21-9	Aroclor-1242	68	U
12672-29-6	Aroclor-1248	68	U
11097-69-1	Aroclor-1254	58	U
11096-82-5	Arocior-1260	58	U

EPA	SAMF	LE NO.
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W70260

Lab Name:	Severn Trent Labora	tories-VT	Lab Code: _	INCHVT		
Contract:	99000		Case:	РСВ	SDG:	KAL084
Phase Type:	SOIL	-	La	b Sample ID:	381014	
Phase Weight:	10.0	(g)	Da	te Received:	03/25/99	
Injection Volume:	1.0	(uL)	Dat	te Extracted:	03/30/99	
Dilution Factor:	1.0		Da	te Analyzed:	04/17/99	
% Solids:	68		Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	74	U
11104-28-2	Aroclor-1221	74	U
11141-16-5	Aroclor-1232	74	U
63469-21-9	Aroclor-1242	74	υ
12672-29-6	Aroclor-1248	74	U
11097-69-1	Aroclor-1254	74	U
11096-82-5	Aroclor-1260	74	U

EPA SAMPLE NO.

 W70261		

'Lab Name:	Severn Trent Labora	tories-VT	Lab Code: _	INCHVT			
Contract:	99000		Case;	РСВ	SDG:	KAL084	
Phase Type:	SOIL		Lab	o Sample ID:	381015		
Phase Weight:	10.0	(g)	Dat	e Received:	03/25/99		
injection Volume:	1.0	(uL)	Date	e Extracted:	04/04/99		
Dilution Factor:	1.0		Dat	e Analyzed:	04/17/99		
% Solids:	25		Sulfi	ır Clean-up:	N	(\tau_	N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
63469-21-9	Arocior-1242	200	U
12672-29-6	Arocior-1248	200	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U

		W70262	
- -	SDG:	KAL084	
	3810	16	

Lab Name:	Severn Trent Laborato	ories-VT	Lab Code:	<u>INCHVT</u>		
: Contract:	99000		Case:	PCB	SDG:	KAL084
Phase Type:	SOIL		L	ab Sample ID:	381016	
Phase Weight:	10.0	(g)	D	ate Received:	03/25/99	
Injection Volume:	1.0	(uL)	D	ate Extracted:	03/30/99	
Dilution Factor:	1.0		D	ate Analyzed:	04/17/99	
% Solids:	86		Su	lfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	. 68	U
11104-28-2	Aroclor-1221	58	U
11141-16-5	Aroclor-1232	58	U
53469-21-9	Aroclor-1242	58	U
12672-29-6	Aroclor-1248	58	U
11097-69-1	Aroclor-1254	58	U
11096-82-5	Aroclor-1260	58	U

EPA SAMPLE NO.

W7	02	63
W/	VΖ	oJ

				V	N70263	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code: <u>INCHVT</u>	L		
Contract:	99000	Variania	Case: PCB	. SDG:	KAL084	
Phase Type:	SOIL		Lab Sample ID:	381017		
Phase Weight:	10.0	(g)	Date Received:	03/25/99		
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99		
Dilution Factor:	1.0	 	Date Analyzed:	04/17/99	· · · · · · · · · · · · · · · · · · ·	
% Solids:	81		Sulfur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	62	U
11104-28-2	Aroclor-1221	62	U
11141-16-5	Aroclor-1232	62	U
53469-21-9	Aroclor-1242	62	U
12672-29-6	Aroclor-1248	62	U
11097-69-1	Aroclor-1254	62	U
11096-82-5	Aroclor-1260	62	U

EPA SAMPLE NO.

	W70265		
_	SDG: _	KAL084	<u></u>
<u> </u>	381018		

(Y/N)

Lab Name: Severn Trent Laboratories-VT Lab Code: INCHVT 99000 **PCB** Contract: Case: Phase Type: WATER Lab Sample ID: 990. (mL) 03/25/99 Phase Weight: **Date Received:** 03/30/99 (uL) Date Extracted: **Injection Volume:** 1.0 Date Analyzed: 04/16/99 **Dilution Factor:**

% Solids:

CAS NO.	COMPOUND	POUND CONCENTRATION ug/L	
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
63469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

Sulfur Clean-up:

W70266	
W70266	

						W70266	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT			
Contract:	99000		Case:	PCB	SDG:	KAL084	
Phase Type:	SOIL		L	ab Sample ID:	381019		
Phase Weight:	10.0	(g)	D	ate Received:	03/25/99		
Injection Volume:	1.0	(uL)	D	ate Extracted:	03/30/99		
Dilution Factor:	1.0		D	ate Analyzed:	04/17/99		
% Solids:	89		Su	lfur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	56	U
11104-28-2	Aroclor-1221	56	U
11141-16-5	Aroclor-1232	56	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	. 56	U
11096-82-5	Aroclor-1260	56	U

EPA SAMPLE NO.

	W70267		
	SDG: _	KAL084	<u> </u>
:	381020		

(Y/N)

Lab Name:	Severn Trent Laboratori	es-VT	Lab Code:	INCHVT	<u> </u>	
Contract:	99000	-	Case:	РСВ	SDG:	KAL084
Phase Type:	SOIL	<u>.</u>	L	ab Sample ID:	381020	
Phase Weight:	10.0	_ (g)	Ε	Date Received:	03/25/99	
njection Volume:	1.0	(uL)	D	ate Extracted:	03/30/99	
Dilution Factor:	1.0	_	r	Date Analyzed:	04/17/99	· · · · · · · · · · · · · · · · · · ·

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	69	U
11104-28-2	Aroclor-1221	59	U
11141-16-5	Aroclor-1232	59	U
6 3469-21-9	Aroclor-1242	59	Ú
12672-29-6	Arocior-1248	59	U
11097-69-1	Aroclor-1254	59	U
11096-82-5	Aroclor-1260	59	U

Sulfur Clean-up:

EPA	SA	MP	LE	N	10.
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W70268

Lab Name:	Severn Trent Labora	tories-VT	Lab Code:INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL084
Phase Type:	SOIL		Lab Sample ID:	381021	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/17/99	
% Solids:	62		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	81	U
11104-28-2	Aroclor-1221	81	U
11141-16-5	Aroclor-1232	81	U
63469-21-9	Aroclor-1242	81	U
12672-29-6	Aroclor-1248	81	U
11097-69-1	Aroclor-1254	81	U
11096-82-5	Aroclor-1260	81	U

W70269	
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						W70269	
Lab Name: Contract:	Severn Trent Labora 99000	tories-VT	Lab Code: Case:	PCB	SDG:	KAL084	_
Phase Type:	SOIL		La	ab Sample ID:	381022		
Phase Weight:	10.0	(g)	Da	ate Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	ite Extracted:	03/30/99		
Dilution Factor:	1.0		Da	ate Analyzed:	04/17/99		
% Solids:	88		Sul	fur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg		
12674-11-2	Aroclor-1016	57	U	
11104-28-2	Aroclor-1221	67	U	
11141-16-5	Aroclor-1232	67	U	
63469-21-9	Aroclor-1242	67	U	
12672-29-6	Arocior-1248	67	Ü	
11097-69-1	Aroclor-1254	67	U	
11096-82-5	Aroclor-1260	67	U	

EPA SAMPLE NO.

		W70270	
_	SDG:	KAL084	

Lab Name: Severn Trent Laboratories-VT Lab Code: INCHVT 99000 **PCB** Contract: Case: SOIL 381023 Lab Sample ID: Phase Type: 10.0 (g) 03/25/99 **Date Received:** Phase Weight: 1.0 (uL) 03/30/99 **Date Extracted:** Injection Volume: 10.0 04/17/99 **Dilution Factor:** Date Analyzed: 79 N (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	630	U
11104-28-2	Aroclor-1221	630	U
11141-16-5	Aroclor-1232	630	U
53469-21-9	Arocior-1242	630	U
12672-29-6	Aroclor-1248	630	U
11097-69-1	Aroclor-1254	4400	
11096-82-5	Aroclor-1260	630	U

	W70271	
- 1		

	Severn Trent Labora	utorios VT	a stransition	BIOLECT.		1070271	
Contract:	99000	mories-v i	Lab Code: Case:	PCB	SDG:	KAL084	
Phase Type:	SOIL		Lab :	Sample ID:	381024		
Phase Weight:	10.0	(g)	Date	Received: _	03/25/99		
Injection Volume:	1.0	(uL)	Date	Extracted:	03/30/99		
Dilution Factor:	1.0		Date	Analyzed: _	04/17/99		
% Solids:	81	<u> </u>	Sulfur	Clean-up:	N		Y/N)
-							

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	62	U
11104-28-2	Aroclor-1221	62	U
11141-16-5	Aroclor-1232	62	U
63469-21-9	Arocior-1242	62	U
12672-29-6	Aroclor-1248	62	U
11097-69-1	Aroclor-1254	290	
11096-82-5	Aroclor-1260	62	U

EPA SAMPLE NO.

W70272 KAL084 SDG: 381025

Lab Name: Severn Trent Laboratories-VT Lab Code: INCHVT 99000 **PCB** Contract: Case: SOIL Lab Sample ID: Phase Type: 10.0 (g) 03/25/99 Date Received: Phase Weight: 1.0 (uL) 03/30/99 Date Extracted: Injection Volume: 1.0 04/17/99 Dilution Factor: Date Analyzed: (Y/N)

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
53469-21- 9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	86	U
11096-82-5	Aroclor-1260	86	U

Sulfur Clean-up:

Lab Name: Şe	evern Trent Labora	itories-VT	Lab Code: INCHVT	W70	273
Contract:	99000		Case: PCB	SDG: K	AL084
Phase Type:	SOIL		Lab Sample ID:	381026	
Phase Weight:	10.0	(g)	Date Received:	03/25/99	
jection Volume:	1.0	(uL)	Date Extracted: _	03/30/99	
Dilution Factor:	1.0		Date Analyzed:	04/17/99	
% Solids:	85		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	69	U
11104-28-2	Aroclor-1221	59	U
11141-16-5	Aroclor-1232	59	U
63469-21-9	Aroclor-1242	69	U
12672-29-6	Aroclor-1248	59	U
11097-69-1	Aroclor-1254	59	υ
11096-82-5	Aroclor-1260	59	U

						W70274	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT	L		
Contract:	99000		Case: _	РСВ	SDG:	KAL084	
Phase Type:	SOIL		La	b Sample ID:	381027		
Phase Weight:	10.0	(g)	Da	ite Received:	03/25/99		
njection Volume:	1.0	(uL)	Da	te Extracted:	03/30/99		
Dilution Factor:	3.0		Da	ite Analyzed:	04/17/99		
% Solids:	77		Sul	fur Clean-up:	N		/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	190	U
11104-28-2	Aroclor-1221	190	U
11141-16-5	Aroclor-1232	190	U
53469-21-9	Aroclor-1242	190	U
12672-29-6	Aroclor-1248	190	Ü
11097-69-1	Aroclor-1254	1700	
11096-82-5	Arocior-1260	190	U

EPA SA	MPL	E NO.
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						W70275	i
Lab Name: Se	99000	atories-VT	Lab Code: . Case: _	PCB	SDG:	KAL084	·
Phase Type:	SOIL		La	ıb Sample ID:	381028		
Phase Weight:	10.0	(g)	Da	ate Received:	03/25/99		
ection Volume:	1.0	(uL)	Da	ite Extracted:	03/30/99		
Dilution Factor:	5.0		Da	ate Analyzed:	04/17/99		
% Solids:	84		Sul	fur Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	300	U
11104-28-2	Aroclor-1221	300	U
11141-16-5	Aroclor-1232	300	U
63469-21-9	Aroclor-1242	300	U
12672-29-6	Aroclor-1248	300	U
11097-69-1	Aroclor-1254	1700	
11096-82-5	Aroclor-1260	300	U

Lab Code:

EPA	SA	MP	LE	NO.

W70276 KAL084 SDG: 381029

99000 **PCB** Case: Contract: SOIL Phase Type: Lab Sample ID: 03/25/99 10.0 (g) **Date Received:** Phase Weight: 1.0 03/30/99 (uL) Date Extracted: Injection Volume: 04/17/99 2.0 Date Analyzed: **Dilution Factor:** 82 (Y/N) % Solids: Sulfur Clean-up:

Lab Name: Severn Trent Laboratories-VT

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	120	U
11104-28-2	Arocior-1221	120	U
11141-16-5	Aroclor-1232	120	U
53469-21-9	Aroclor-1242	120	U
12672-29-6	Aroclor-1248	120	U
11097-69-1	Aroclor-1254	910	
11096-82-5	Aroclor-1260	110	J

EPA	SAMP	LE NO.
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						W70277	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT	L		
. Contract:	99000	<u> </u>	Case: _	PCB	SDG:	KAL084	_
Phase Type:	SOIL		La	ıb Sample ID:	381030		
Phase Weight:	10.0	(g)	Da	ite Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	te Extracted:	03/30/99		
Dilution Factor:	1.0		Da	ite Analyzed:	04/17/99		
% Solids:	58		Sul	fur Clean-up:	N	(Y/N	1)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	86	U
11104-28-2	Aroclor-1221	86	U
11141-16-5	Aroclor-1232	86	U
63469-21-9	Aroclor-1242	86	U
12672-29-6	Aroclor-1248	86	U
11097-69-1	Aroclor-1254	86	U
1096-82-6	Aroclor-1260	86	U

EPA SAMPLE NO.

04/17/99

(Y/N)

						W70278	
Lab Name:	Severn Trent Laborator	les-v I	Lab Code:	INCHVT			
Contract:	99000	_	Case: _	РСВ	SDG: _	KAL084	
Phase Type:	SOIL		La	b Sample ID:	381031	·.	
Phase Weight:	10.0	_ (g)	Da	te Received:	03/25/99		
Injection Volume:	1.0	_ (uL)	Dat	ie Extracted:	03/30/99)	

1.0

80

Dilution Factor:

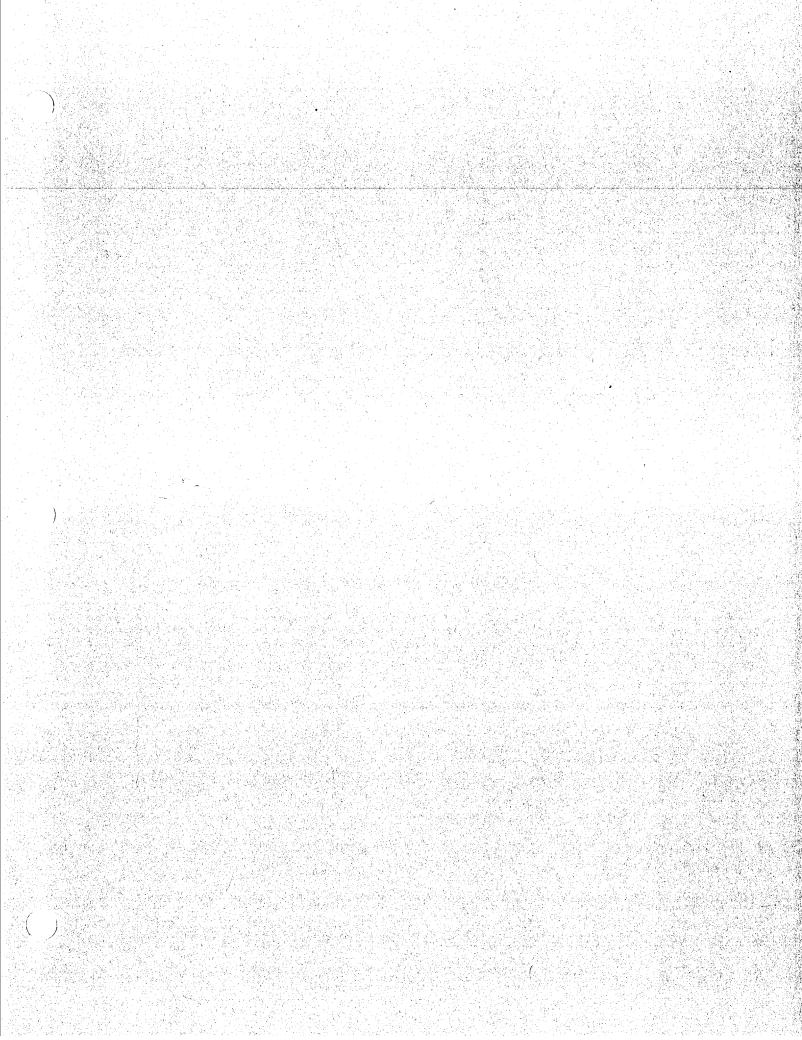
% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	62	U
11104-28-2	Aroclor-1221	62	U
11141-16-5	Aroclor-1232	62	U
63469-21-9	Aroclor-1242	62	U
12672-29-6	Aroclor-1248	62	U
11097-69-1	Aroclor-1254	62	U
11096-82-5	Aroclor-1260	62	U

Date Analyzed:

Sulfur Clean-up:





DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# KAL085

PCB ANALYSES

WILLOW BLVD.

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:

BBL

BLASLAND, BOUCK & LEE, INC.

engineers & scientists

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# KAL085 for Willow Blvd. soil sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB analyses. Analyses were performed on the following samples:

				Ai			S	
Sample ID	Lab ID	Matrix	Sample Date	VOA	BNA	PCB	TAL	MISC
W70279	381032	solid	3/24/99			х		
W70280	381033	solid	3/24/99			х		
W70281	381034	solid	3/24/99			x		
W70282	381035	solid	3/24/99			х		
W70283	381036	solid	3/24/99			x		
W70284	381037	solid	3/24/99			x		
W70285*	381038	solid	3/24/99			х		
W70286	381039	solid	3/24/99			x		
W70288	381040	solid	3/24/99			x		
W70289	381041	solid	3/24/99			x		
W70290	381042	solid	3/24/99			х		
W70291	381043	solid	3/24/99			х		
W70292	381044	solid	3/24/99			x		
W70293	381055	solid	3/24/99			x		
W70294	381066	solid	3/24/99			x		
W70295	381259	solid	3/24/99			x		
W70296	381048	solid	3/24/99			x		
W70297	381049	solid	3/24/99			x		
W70298	381050	solid	3/24/99			х		
W70299	381051	solid	3/24/99			×		

MS/MSD analyses performed on sample

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of soil samples are 10 days from sample receipt to extraction and 40 days to analysis. The technical holding times are 14 days from sample collection to extraction and 40 days to analysis.

All samples were extracted and analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blank. No rinse blanks were submitted with this sample set.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

wka1065

Surrogates were diluted beyond the range of detection in the matrix spike and matrix spike duplicate. No data have been qualified based on diluted surrogates. All sample surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

Although biphenyls appear to be present in sample W70286, a clear match to a specific Aroclor could not be made. Based on the lack of an Aroclor match, data for this sample have been qualified as undetected. All other Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. Field Duplicates

No field duplicates were included in this data set.

9. General Comments

The PCB analyses of all samples in this delivery group were subjected to sulfur cleanup, The reporting forms incorrectly indicate that this procedure was not performed.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X	****	
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		<u> x</u>	
Holding Times			
Have any holding times been exceeded?		<u> </u>	·.
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		*
Were surrogate recoveries outside of specified limits for any sample or blank?		X	
If yes, were the samples reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
out of8_			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
Is a Method Blank Summary Form present?	<u> </u>		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Do any method/reagent/instrument blanks have positive results?		<u>X</u>	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		<u> </u>	

PCB Data Review Checklist - Page 2

	YES	NO	NA
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u> </u>		
Aroclor 1221	<u> </u>		
Aroclor 1232	X		
Aroclor 1242	<u> </u>		<u>·</u>
Aroclor 1248	<u> </u>		
Aroclor 1254	<u> </u>		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	x		
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	-	
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>x</u>		
Was the proper analytical sequence followed?	x		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			x
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>x</u>		
Do the combined column and individual column Aroclor identifications agree?	<u>x</u>		
Were there any false negatives?		<u> </u>	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limits	<u> </u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?	Marine and the second	<u>X</u>	
Field Duplicates			
Were field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate **Recovery Summary**

Sample ID	Holding Time	Surrogates			
		TCX	DCB		
W70279					
W70280					
W70281					
W70282					
W70283			··-		
W70284					
W70285					
W70286					
W70288					
W70289					
W70290					
W70291					
W70292					
W70293					
W70294					
W70295					
W70296					
W70297					
W70298					
W70299					
W70285MS		D	D		
W70285MSD		D .	D		
	·	·			
	·				

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

wkal085

PCB Calibration Summary - Page 2

) Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	404400	4/24/00			
Time:	4/21/99 0650	4/21/99 0714			
; illie.	Cont.	Cont.			
	Cal.	Cal.			
	%D	%D			
Arocior 1016					
Aroclor 1221	<u> </u>				
Aroclor 1232			 		
Aroclor 1242		ok			
Aroclor 1248	ok				
Aroclor 1254					
Aroclor 1260					
Tetrachloro-m-xylene					
Decachlorobiphenyl				-	
Affected Samples:					
		1			

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/6/99-	4/20/99	4/20/99	4/20/99	4/20/99	4/21/99	4/21/99
Time:	4/7/99	1446	1511	2024	2048	0201	0225
	Initial Cal.	Gont. Cal.	Cont. Cal	Gont. Cal	Cont. Cal	Cont. Cal.	Cont. Cal.
	%RSD	Q %	%D	%D	%D	%D	%D
Aroclor 1016	ok						
Aroclor 1221	. ok						
Aroclor 1232	ok						
Aroclor 1242	ok		ok				
Aroclor 1248	ok	ok		ok		ok	
Aroclor 1254	ok				ok		
Aroclor 1260	ok						ok
Tetrachioro-m-xylene	ok						
Decachlorobiphenyl	ok						
Affected Samples:							
			_				
				:			
					1		

CORRECTED ANALYSIS SUMMARY FORMS

						W70279	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT	<u> </u>		
Contract:	99000		Case: _	РСВ	SDG:	KAL085	
Phase Type:	SOIL		La	ıb Sample ID:	381032		
Phase Weight:	10.0	(g)	Da	ite Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	te Extracted:	04/01/99		
Dilution Factor:	1.0		Da	ate Analyzed:	04/20/99		
% Solids:	88		Suf	fur Clean-up:	N		Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	67	Ü
11104-28-2	Aroclor-1221	67	U
11141-16-5	Aroclor-1232	57	U
63469-21-9	Aroclor-1242	57	U
12672-29-6	Aroclor-1248	57	U
11097-69-1	Arocior-1254	57	U
11096-82-5	Aroclor-1260	57	U

	,	W70280	
_	SDG:	KAL085	
);	381033		

Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	<u>INCHVT</u>	L	
Contract:	99000		Case:	РСВ	SDG:	KAL085
Phase Type:	SOIL		L	ab Sample ID:	381033	
Phase Weight:	10.1	(g)	D	ate Received:	03/25/99	
njection Volume:	1.0	(uL)	D	ate Extracted:	04/01/99	
Dilution Factor:	1.0		. 0	ate Analyzed:	04/20/99	
% Solids:	91		Su	ifur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	54	U
11104-28-2	Aroclor-1221	64	U
11141-16-5	Aroclor-1232	64	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-6	Arocior-1260	54	U

EPA SAMPLE NO.

			W70281		
_ 1	_ab Code: _ Case:	INCHVT PCB	SDG:	KAL085	ل
	Case: _		3DG:		
	Lab Sample ID:		381034	<u></u>	
	Dat	e Received:	03/25/99)	

	Contract:	99000		Case:	PCB	SDG:	KAL085	
	Phase Type:	SOIL	****	Lai	Sample ID:	381034		
	Phase Weight:	10.0	(g)	Dat	le Received:	03/25/99		
Inj	ection Volume:	1.0	(uL)	Dat	e Extracted:	04/01/99		
E	Dilution Factor:	1.0	·	Dat	te Analyzed:	04/20/99		
	% Solids:	90		Suifi	ur Clean-up:	N	(Y/I	N)

Lab Name: Severn Trent Laboratories-VT

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	56	U
11104-28-2	Aroclor-1221	56	U
11141-16-5	Arocior-1232	56	U
53469-21-9	Arocior-1242	56	U
12672-29-6	Arocior-1248	56	U
11097-69-1	Aroclor-1254	56	U
11096-82-5	Aroclor-1260	56	U

					W70282		
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT	L		
Contract:	99000		Case:	PCB	SDG:	KAL085	·
Phase Type:	SOIL		L	ab Sample ID: _	381035	·	
Phase Weight:	10.3	(g)	D	ate Received:	03/25/99		•
injection Volume:	1.0	(uL)	Da	ate Extracted:	04/01/99	· ·	
Dilution Factor:	1.0		D	ate Analyzed:	04/20/99	<u> </u>	
% Solids:	81		Su	ifur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	60	U
11104-28-2	Aroclor-1221	60	U
11141-16-5	Aroclor-1232	60	U
53469-21-9	Aroclor-1242	60	U
12672-29-6	Aroclor-1248	60	U
11097-69-1	Aroclor-1254	610	
11096-82-5	Aroclor-1260	60	U

	W70283			
	SDG: _	KAL085	<u> </u>	
D:	381036	<u></u>		

Lab Name:	Severn Trent Laboratorie	es-VT	Lab Code:	INCHVT	<u> </u>	· · · · · · · · · · · · · · · · · ·	ل
· Contract:	99000		Case:	PCB	SDG:	KAL085	
Phase Type:	SOIL		L	.ab Sample ID:	381036	····	
Phase Weight:	10.0	(g)	E	Date Received:	03/25/99		
Injection Volume:	1.0	(uL)	0	ate Extracted:	04/01/99		
Dilution Factor:	1.0		c	Date Analyzed:	04/20/99		
% Solids:	85		Sı	ulfur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER	
12674-11-2	Aroclor-1016	59	U	
11104-28-2	Aroclor-1221	59	U	
11141-16-5	Arocior-1232	69	U	
634 69-21-9	Arocior-1242	59	U	
12672-29-6	Arocior-1248	59	U	
11097-69-1	Aroclor-1254	46	J	
11096-82-5	Arocior-1260	59	U	

EPA SAMPLE NO.

04/20/99

N

(Y/N)

					W70284		
Lab Name: 3	Severn Trent Labora	Lab Code:	INCHVT		<u> </u>		
Contract:	99000		Case: _	PCB	SDG:	KAL085	
Phase Type:	SOIL		La	b Sample ID:	381037		
Phase Weight:	10.2	(g)	Da	te Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	te Extracted:	04/01/99	1	

1.0

Dilution Factor:

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	69	U
11104-28-2	Aroclor-1221	59	U
11141-16-5	Aroclor-1232	59	U
53469-21-9	Aroclor-1242	59	U
12672-29-6	Aroclor-1248	69	U
11097-69-1	Arocior-1254	59	U
11096-82-5	Arocior-1260	59	U

Date Analyzed:

Sulfur Clean-up:

Lab Name: §	Severn Trent Laboratories-VT		Lab Code: INCHVT				
Contract:	99000			PCB	SDG:	KAL085	
Phase Type:	SOIL		Lab Sa	mple ID: _	381038		
Phase Weight:	10.0	(g)	Date R	eceived:	03/25/99		
Injection Volume:	1.0	(uL)	Date Ex	ctracted:	04/01/99		
Dilution Factor:	1.0		Date A	nalyzed:	04/20/99		
% Solids:	83		Sulfur C	lean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	60	U
11104-28-2	Aroclor-1221	60	U
11141-16-5	Aroclor-1232	60	U
53469-21-9	Aroclor-1242	60	U
12672-29-6	Aroclor-1248	60	U
11097-69-1	Aroclor-1254	60	U
11096-82-5	Aroclor-1260	. 60	U

	W7028	16
1		
•		

Lab Name:	Severn Trent Labora	tories-VT	Lab Code:INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL085
Phase Type:	SOIL		Lab Sample ID:	381039	
Phase Weight:	10.1	(g)	Date Received:	03/25/99	
injection Volume:	1.0	(uL)	Date Extracted:	04/01/99	
Dilution Factor:	1.0		Date Analyzed:	04/20/99	
% Solids:	86		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	68	U
11104-28-2	Aroclor-1221	58	U
11141-16-5	Aroclor-1232	58	U
53469-21-9	Arocior-1242	58	U
12672-29-6	Aroclor-1248	58	U
11097-69-1	Arocior-1254	58	U
11096-82-5	Aroclor-1260	. 74	u

					W70288		
Lab Name: <u>Se</u>	vern Trent Labora	tories-VT	Lab Code:	<u>INCHVT</u>	L		
. Contract:	99000		Case:	PCB	SDG:	KAL085	
Phase Type:	SOIL	····	La	ab Sample ID:	381040		
Phase Weight:	10.0	(g)	Da	ate Received:	03/25/99		
njection Volume:	1.0	(uL)	Da	ite Extracted:	04/01/99		
Dilution Factor:	1.0		Da	ate Analyzed:	04/20/99		
% Solids:	93		Sui	fur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	54	U
11104-28-2	Aroclor-1221	54	U
11141-16-5	Aroclor-1232	54	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	54	U

EPA SAMPLE NO.

W70289

Lab Name:	Severn Trent Labora	itories-VT	Lab Code: INC	I VT			
Contract:			Case: PC	В	SDG:	KAL085	
Phase Type:	SOIL		Lab Samp	ole ID:	381041		
Phase Weight:	10.0	(g)	Date Reco	eived:	03/25/99		
Injection Volume:	1.0	(uL)	Date Extra	acted:	04/01/99		
Dilution Factor:	1.0		Date Anal	yzed:	04/20/99		
% Solids:	91		Sulfur Clea	ın-up:	N		(Y/N)
					-		

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER	
12674-11-2	Aroclor-1016	65	U	
11104-28-2	Aroclor-1221	55	U	
11141-16-5	Aroclor-1232	65	U	
63469-21-9	Aroclor-1242	55	ប	
12672-29-6	Aroclor-1248	55	U	
11097-69-1	Aroclor-1254	55	U	
11096-82-5	Aroclor-1260	55	U	

W70290

	Severn Trent Labora	etorias VT	Lab Oadaa WOUNT		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Contract:		I(OI)e2-4 I	Lab Code: INCHVT Case: PCB	SDG:	KAL085	
Phase Type:	SOIL		Lab Sample ID:	381042		
Phase Weight:	10.0	(g)	Date Received:	03/25/99		
Injection Volume:	1.0	(uL)	Date Extracted:	04/01/99		
Dilution Factor:	1.0		Date Analyzed:	04/20/99		
% Solids:	87		Sulfur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER	
12674-11-2	Arocior-1016	57	U	
11104-28-2	Aroclor-1221	57	U	
11141-16-5	Aroclor-1232	57	U	
53469-21-9	Arocior-1242	57	U	
12672-29-6	Aroclor-1248	57	U	
11097-69-1	Arocior-1254	57	U	
11096-82-5	Aroclor-1260	57	U	

					,	W70291	
Lab Name: Severn Trent Laboratories-VT		Lab Code:INCHVT		L			
· Contract:	99000		Case: _	PCB	SDG:	KAL085	
Phase Type:	SOIL		La	b Sample ID:	381043		
Phase Weight:	10.3	(g)	Da	ite Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	te Extracted:	04/01/99		
Dilution Factor:	1.0		Da	ite Analyzed:	04/21/99		
% Solids:	84		Suit	fur Clean-up:	N	((Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	58	U
11104-28-2	Aroclor-1221	58	U
11141-16-5	Aroclor-1232	58	U
534 69-21-9	Aroclor-1242	58	U
12672-29-6	Aroclor-1248	68	U
11097-69-1	Aroclor-1254	58	U
11096-82-5	Aroclor-1260	58	U

EPA SAMPLE NO.

W70292

Lab Name: 3	Severn Trent Laborat	ories-VT	Lab Code: INCHVT		
Contract:	99000	_	Case: PCB	SDG:	KAL085
Phase Type:	SOIL		Lab Sample ID:	381044	
Phase Weight:	10.3	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	04/01/99	
Dilution Factor:	1.0		Date Analyzed:	04/21/99	
% Solids:	90		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	54	U ·
11104-28-2	Aroclor-1221	54	U
11141-16-6	Aroclor-1232	54	U
63469-21-9	Arocior-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Arocior-1254	54	U
11096-82-5	Aroclor-1260	54	U

EPA SAMPLE NO.

04/21/99

N

(Y/N)

				W70293	
Lab Name:	Severn Trent Laborato	ries-VT	Lab Code: INCHVT		
Contract:	99000	_	Case: PCB	SDG: KAL08	5
Phase Type:	SOIL	_	Lab Sample ID:	381045	-
Phase Weight:	10.0	(g)	Date Received:	03/25/99	_
Injection Volume:	1.0	(uL)	Date Extracted:	04/01/99	_

1.0

89

Dilution Factor:

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	56	U
11104-28-2	Aroclor-1221	56	U
11141-16-5	Aroclor-1232	56	U
53469-21-9	Aroclor-1242	- 56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Arocior-1254	56	Ų
11096-82-5	Aroclor-1260	. 56	U

Date Analyzed:

Sulfur Clean-up:

W70294	

					\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	W70294	
Lab Name:	Severn Trent Labora	tories-VT	Lab Code:	INCHVT			
Contract:	99000		Case: _	PCB	SDG:	KAL085	
Phase Type:	SOIL		La	ab Sample ID:	381046		
Phase Weight:	10.4	(g)	Da	ate Received:	03/25/99		
njection Volume:	1.0	(uL)	Da	ite Extracted:	04/01/99		
Dilution Factor:	1.0		Da	ate Analyzed:	04/21/99		
% Solids:	93		Sui	fur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	52	U
11104-28-2	Aroclor-1221	52	U
11141-16-5	Aroclor-1232	52	U
53469-21-9	Aroclor-1242	52	U
12672-29-6	Aroclor-1248	52	υ
11097-69-1	Aroclor-1254	52	U
11096-82-5	Aroclor-1260	52	U

EPA SAMPLE NO.

	W70295
- (
	1701.000

Lab Name: Severn Trent Laboratories-VT Lab Code: INCHVT 99000 **PCB KAL085** Case: SDG: Contract: 381259 SOIL Phase Type: Lab Sample ID: 10.0 03/25/99 (g) Phase Weight: Date Received: 04/01/99 1.0 (uL) Injection Volume: **Date Extracted:** 1.0 04/21/99 **Dilution Factor:** Date Analyzed: 95 N (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	53	U
11104-28-2	Aroclor-1221	53	U
11141-16-5	Aroclor-1232	53	U
53469-21-9	Aroclor-1242	63	U
12672-29-6	Arocior-1248	53	U
11097-69-1	Arocior-1254	53	U
11096-82-5	Arocior-1260	53	U

				v	770296
Lab Name: S	evern Trent Labora	tories-VT	Lab Code: INCHVT	_	
Contract: _	99000	_	Case: PCB	SDG:	KAL085
Phase Type: _	SOIL		Lab Sample ID:	381048	
Phase Weight: _	10.0	(g)	Date Received:	03/25/99	
Injection Volume: _	1.0	(uL)	Date Extracted:	04/04/99	
Dilution Factor:	1.0		Date Analyzed:	04/21/99	·····
% Solids:	86		Sulfur Clean-up:	N	_(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	68	U
11104-28-2	Arocior-1221	58	U
11141-16-5	Aroclor-1232	. 58	U
63469-21-9	Arocior-1242	58	U
12672-29-6	Aroclor-1248	58	U
11097-69-1	Aroclor-1254	58	U
11096-82-5	Aroclor-1260	58	U

		W70297	
-	SDG:	KAL085	

Lab Name: S	evern Trent Labora	tories-VT	Lab Code: <u>INCHVT</u>		
Contract:	99000		Case: PCB	_ SDG:	KAL085
Phase Type:	SOIL		Lab Sample ID:	381049	
Phase Weight:	10.1	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	04/01/99	·.
Dilution Factor:	1.0		Date Analyzed:	04/21/99	
% Solids: _	89		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	56	U
11104-28-2	Aroclor-1221	56	U
11141-16-5	Aroclor-1232	56	U
5 3469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	56	U
11096-82-5	Aroclor-1260	56	U

INCHVT

Lab Code:

EPA SAMPLE NO.

	W70298	
 SDG:	KAL085	
381050		

99000 PCB . Contract: Case: SOIL Phase Type: Lab Sample ID: 10.1 03/25/99 (g) Phase Weight: **Date Received:** (uL) 04/01/99 Injection Volume: Date Extracted: **Dilution Factor:** 1.0 Date Analyzed: 04/21/99 (Y/N) % Solids: Sulfur Clean-up:

Lab Name: Severn Trent Laboratories-VT

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	64	U
11104-28-2	Aroclor-1221	54	U
11141-16-5	Aroclor-1232	54	U
534 69-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	64	U
11097-69-1	Arocior-1254	54	U
11096-82-5	Aroclor-1260	54	U

			•			W70299	
Lab Name: S	evern Trent Labora	atories-VT	Lab Code:	INCHVT		-	
Contract: _	99000		Case: _	PCB	SDG:	KAL085	
Phase Type:	SOIL		Lai	b Sample ID:	381051		
Phase Weight:	10.2	(g)	Da	te Received:	03/25/99		
njection Volume: _	1.0	(uL)	Dat	te Extracted:	04/01/99)	
Dilution Factor:	1.0		Da	te Analyzed:	04/21/99	<u> </u>	
% Solids: _	88		Sulf	ur Clean-up:	N		Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	56	U
11104-28-2	Aroclor-1221	56	.U
11141-16-5	Aroclor-1232	56	ل
63469-21-9	Arocior-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	56	U
11096-82-5	Aroclor-1260	56	υ





DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# KAL086

PCB ANALYSES

WILLOW BLVD.

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:

BBI BLASLAND, BOUCK & LEE, INC. engineers & scientists

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# KAL086 for Willow Blvd. soil sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB analyses. Analyses were performed on the following samples:

Sample ID	Lab ID Matrix			Analyses				
		Sample Date	VOA	BNA	PCB	TAL	MISC	
W70300	381052	solid	3/24/99			x		
W70301	381053	solid	3/24/99			x		
W70302	381054	solid	3/24/99			x		
W70303	381055	solid	3/24/99			×		
W70304	381056	solid	3/24/99			x		
W70305	381057	solid	3/24/99			x		
W70306	381058	solid	3/24/99			х		
W70307	381059	solid	3/24/99			x		
W70308	381060	solid	3/24/99			x		
W70309	381061	solid	3/24/99			x		
W70310*	381062	solid	3/24/99			x		
W70311	381063	solid	3/24/99			x		
W70313	381064	solid	3/24/99			x		
W70314	381065	solid	3/24/99			x		
·								
		·						

MS/MSD analyses performed on sample

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for nonlinearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of soil samples are 10 days from sample receipt to extraction and 40 days to analysis. The technical holding times are 14 days from sample collection to extraction and 40 days to analysis.

All samples were originally extracted and analyzed within the specified holding times. However, due to a spiking error (sample W70306 was spiked with matrix spiking solution in place of the matrix spike W70310-MS), samples W70306 and W70310 and the matrix spike and matrix spike duplicate, W70310-MS and W70310-MSD were reextracted over the specified holding time. All data for the reextracted sample W70306 have been qualified as estimated based on the holding time violation. Since data for the original and reextracted analyses of sample W70310 showed good agreement (i.e., no indication of laboratory spiking error), it is recommended that data from the original, compliant analysis be used for all Aroclors.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method or rinse blanks.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

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4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for both surrogates were below control limits in the rinse blank (W70314). All data for the blank have been qualified as estimated based on this deviation. Surrogates were diluted beyond the range of detection in samples W70300, W70306, W70309, W7030310MSD, W70310MSRE and W70310MSDRE. No data have been qualified based on diluted surrogates. All other sample surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Due to a lab error the initial matrix spike was not fortified and the resulting recoveries were zero. Upon reextraction all matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. Field Duplicates

No field duplicates were included in this data set.

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9. General Comments

The PCB analyses of all samples in this delivery group were subjected to sulfur cleanup, The reporting forms incorrectly indicate that this procedure was not performed.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	<u>NA</u>
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	<u> </u>		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times		•	
Have any holding times been exceeded?	X		
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Were surrogate recoveries outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		<u> </u>	
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
out of14			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
2 out of <u>4</u> _			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Do any method/reagent/instrument blanks have positive results?	•	<u>x</u>	
Do any field/rinse blanks have positive results?		X	
Are there field/rinse/equipment blanks associated with every sample?	x		

PCB Data Review Checklist - Page 2

	YES	NO	<u>NA</u>
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		·
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	x		
Are %D values for all compounds within limits (less than 15%)?	x		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>x</u>		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification	•		
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			x_
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>x</u>		
Do the combined column and individual column Aroclor identifications agree?			
Were there any false negatives?		<u>X</u>	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?		-	X
Compound Quantitation and Reported Detection Limit	ts		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?	4	x	
Field Duplicates			
Were field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates		
		TCX	DCB	
W70308				
W70309		D	D	
W70310				
W70310MS				
W70310MSD		D	D	
W70311				
W70313		\		
W70314		<u> </u>		
W70306RE	+12		· · · · · · · · · · · · · · · · · · ·	
W70310RE	+12		· · · · · · · · · · · · · · · · · · ·	
W70310MSRE	+12	D	<u>D</u>	
W70310MSDRE	+12	D	D	
W70300		D	D	
W70301				
W70302			:	
W70303				
W70304				
W70305				
W70306	·	D	D	
W70307				
			·	
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Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

Surrogates diluted out Recovery high Recovery low D

Unless otherwise noted, all parameters are within specified limits.

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PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/6/99-	4/28/99	4/28/99	4/29/99	4/29/99	4/29/99	4/29/99
Time:	4/7/99	2155	2219	0332	0356	0733	0757
	Initial Cal.	Gont. Cal.	Cont. Cal.	Cont. Cal	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok						
Arocior 1221	ok						
Aroclor 1232	ok						
Arocior 1242	ok		ok				
Aroclor 1248	ok	ok		ok		ok	
Aroclor 1254	ok				ok		
Aroclor 1260	ok			_			ok
Tetrachloro-m-xylene	ok						
Decachlorobiphenyl	ok						
Affected Samples:			Ì				
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				· · · · · · · · · · · · · · · · · · ·			
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PCB Calibration Summary - Page 2

Instrument: <u>HP3327</u> Column: <u>RTX-5 / RTX-35</u>

Date:	4/29/99	4/29/99	4/29/99	4/29/99		
Time:	1226	1250	1803	1827		
	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.		
	%D	%D	%D	%D		
Aroclor 1016						
Aroclor 1221			·			
Aroclor 1232						
Aroclor 1242		ok				
Aroclor 1248	ok		ok			
Aroclor 1254				ok		
Aroclor 1260					<u> </u>	
Tetrachloro-m-xylene						[
Decachiorobiphenyl						
Affected Samples:						:

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CORRECTED ANALYSIS SUMMARY FORMS

EPA SAMPLE NO.

W70300	

Lab Name: S	evern Trent Labora	atories-VT	Lab Code:INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL086
Phase Type:	SOIL	<u>_</u>	Lab Sample ID:	381052	
Phase Weight:	10.2	(g)	Date Received:	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted:	04/01/99	
Dilution Factor:	5.0		Date Analyzed:	04/29/99	
% Solids: _	88		Sulfur Clean-up:	N	(Y/N)
_					

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER
		ug/Kg	
12674-11-2	Aroclor-1016	280	U
11104-28-2	Aroclor-1221	280	U
11141-16-5	Aroclor-1232	280	υ
63469-21-9	Arocior-1242	280	U
12672-29-6	Aroclor-1248	280	U
11097-69-1	Aroclor-1254	1500	
11096-82-5	Aroclor-1260	280	U

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Lab Name:	Severn Trent Laborat	ories-VT	Lab Code: _	INCHVT	L	·	
Contract:	99000		Case: _	PCB	SDG:	KAL086	
Phase Type:	SOIL		Lai	b Sample ID:	381053		
Phase Weight:	10.2	(g)	Da	te Received:	03/25/99		
njection Volume:	1.0	(uL)	Dat	le Extracted:	04/01/99		
Dilution Factor:	1.0	<u>:-</u>	Da	te Analyzed:	04/29/99		
% Solids:	91		Sulf	ur Clean-up:	N		(/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	54	U
11104-28-2	Aroclor-1221	54	U
11141-16-5	Aroclor-1232	54	υ
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	54	U

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Lab Name: <u>\$</u>	evern Trent Labora	tories-VT	Lab Code: _	INCHVT	<u> </u>	
Contract:	99000		Case:	РСВ	SDG:	KAL086
Phase Type:	SOIL		Lai	b Sample ID:	381054	
Phase Weight: _	10.2	(g)	Dat	te Received:	03/25/99	
njection Volume: _	1.0	(uL)	Dat	e Extracted:	04/01/99	
Dilution Factor:	1.0		Dat	te Analyzed:	04/29/99	
% Solids: _	90		Sulfi	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	54	U
11104-28-2	Aroclor-1221	54	U
11141-16-5	Aroclor-1232	54	U
63469-21-9	Aroclor-1242	64	U
12672-29-6	Arocior-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	54	U

EPA SAMPLE NO.

W70303

Lab Name:	Severn Trent Labora	ntories-VT	Lab Code:	INCHVT		
Contract:			Case: _	РСВ	SDG:	KAL086
Phase Type:	SOIL		Lai	b Sample ID:	381055	
Phase Weight:	10.0	(g)	Da	te Received:	03/25/99	
njection Volume:	1.0	(uL)	Dat	te Extracted:	04/01/99	
Dilution Factor:	1.0		Da	te Analyzed:	04/29/99	
% Solids:	84		Sulf	ur Clean-up:	N	(Y/N)
				_		

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	60	U
11104-28-2	Aroclor-1221	60	V
11141-16-5	Aroclor-1232	60	U
53469-21-9	Aroclor-1242	60	U
12672-29-6	Aroclor-1248	60	U
11097-69-1	Aroclor-1254	60	U
11096-82-5	Arocior-1260	60	U

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	•					W70304	
Lab Name:	Severn Trent Labora	atories-VT	Lab Code:	INCHVT	L		
Contract:	99000		Case:	PCB	SDG:	KAL086	
Phase Type:	SOIL		L	ab Sample ID:	381056		
Phase Weight:	10.2	(g)	Đ	ate Received:	03/25/99		
njection Volume:	1.0	(uL)	D	ate Extracted:	04/01/99		
Dilution Factor:	1.0	·	D	ate Analyzed:	04/29/99		
% Solids:	91		Su	Ifur Clean-up:	N		Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER	
12674-11-2	Aroclor-1016	54	U	
11104-28-2	Aroclor-1221	54	U	
11141-16-5	Aroclor-1232	54	U	
53469-21-9	Aroclor-1242	54	υ	
12672-29-6	Aroclor-1248	. 54	U	
11097-69-1	Aroclor-1254	54	U	
11096-82-5	Aroclor-1260	54	U	

Lab Name: S	Severn Trent Labora	tories-VT	Lab Code:	INCHVT		
Contract:	99000	No.	Case: _	РСВ	SDG:	KAL086
Phase Type:	SOIL		La	b Sample ID:	381057	···
Phase Weight:	10.2	(g)	Da	nte Received:	03/25/99	<u> </u>
njection Volume:	1.0	(uL)	Da	te Extracted:	04/01/99	
Dilution Factor:	1.0		Da	ite Analyzed:	04/29/99	
% Solids:	87		Suit	fur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	56	U
11104-28-2	Aroclor-1221	56	U
11141-16-5	Aroclor-1232	56	U
53469-21-9	Aroclor-1242	56 ·	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	56	U
11096-82-5	Aroclor-1260	56	U

EPA SAMPLE NO.

Lab Name:	Severn Trent Labora	ntories-VT	Lab Code:	INCHVT		W70306
Contract:	99000		Case: _	PCB	SDG:	KAL086
Phase Type:	SOIL		La	nb Sample ID:	381058	
Phase Weight:	10.2	(g)	Da	ate Received:	03/25/99	
Injection Volume:	1.0	(uL)	Da	ite Extracted:	04/01/99	
Dilution Factor:	10.0	····	Da	ite Analyzed:	04/29/99	
% Solids;	82		Sui	fur Clean-up:	N/	(Y/N)
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CAS NO.	COMPOUND		CONCENTRATION ug/Kg		QUALIFIER
12674-11-2	Aroclor-1016			600	U
11104-28-2	Aroclor-1221			600	U
11141-16-5	Aroclor-1232			600	U
53469-21-9	Aroclor-1242		7	3900	
12672-29-6	Arocior-1248	$\overline{}$		640	
11097-69-1	Aroclor-1254	/		4000	
11096-82-5	Aroclor-1260	7		600	U

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Lab Name:	Severn Trent Labora	tories-VT	Lab Code: _	INCHVT		· · · · · · · · · · · · · · · · · · ·	
Contract:	99000		Case:	PCB	SDG: _	KAL086	
Phase Type:	SOIL	·	Lab	Sample ID:	381058R	1	
Phase Weight:	10.0	(g)	Date	e Received:	03/25/99)	
injection Volume:	1.0	(uL)	Date	Extracted:	04/20/99	· · · · · · · · · · · · · · · · · · ·	
Dilution Factor:	1.0		Date	e Analyzed:	04/29/99	 	
% Solids:	100		Sulfu	r Clean-up:	N_	(Y/	/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	50	4 VJ
11104-28-2	Arocior-1221	50	ZD 4K
11141-16-5	Arocior-1232	50	B 1/2
53469-21-9	Aroclor-1242	50	A re
12672-29-6	Aroclor-1248	140	7
11097-69-1	Aroclor-1254	50	D) K
11096-82-5	Aroclor-1260	50	r w

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Lab Name:	Severn Trent Labora	atories-VT	_ Lab Code:	INCHVT	<u> </u>		_
Contract:	99000		Case: _	PCB	SDG:	KAL086	
Phase Type:	SOIL		La	b Sample ID:	381059		
Phase Weight:	10.0	(g)	Da	ite Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	te Extracted:	04/01/99		
Dilution Factor:	1.0	<u></u>	Da	ite Analyzed:	04/29/99		
% Solids:	92		Sulf	fur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER
		ug/Kg	
12674-11-2	Aroclor-1016	54	U
11104-28-2	Aroclor-1221	54	U
11141-16-5	Aroclor-1232	54	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Arocior-1248	54	U
11097-69-1	Aroclor-1254	64	U
11096-82-5	Aroclor-1260	54	U

W70308

		A-de ST			1	1110000
Lab Name: Contract:	Severn Trent Labora 99000	IIOFIES-V I	Lab Code: Case:	PCB	SDG:	KAL086
Phase Type:	SOIL	and the same	La	nb Sample ID:	381060	
Phase Weight:	10.1	(g)	Da	ate Received: _	03/25/99	
Injection Volume:	1.0	(uL)	Da	ite Extracted:	04/01/99	
Dilution Factor:	1.0		Da	ate Analyzed:	04/28/99	
% Solids:	88	<u> </u>	Sul	fur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Arocior-1016	56	U
11104-28-2	Arocior-1221	56	U
11141-16-5	Arocior-1232	56	U
63469-21-9	Arocior-1242	56	U
12672-29-6	Arocior-1248	56	U
11097-69-1	Arocior-1254	56	U
11096-82-6	Arocior-1260	56	U

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	Severn Trent Labora	etorias VT	Lab Code:	INCHVT	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Å1020a	
Contract:	99000	nories-V1	Case: _	PCB	SDG:	KAL086	_
Phase Type:	SOIL		Lai	b Sample ID:	381061	<u> </u>	
Phase Weight:	10.1	(g)	Da	te Received:	03/25/99		
njection Volume:	1.0	(uL)	Dat	te Extracted:	04/01/99		
Dilution Factor:	20.0		Da	te Analyzed:	04/28/99		
% Solids:	88		Sulf	ur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	1100	U
11104-28-2	Aroclor-1221	1100	U
11141-16-5	Aroclor-1232	1100	U
53469-21-9	Aroclor-1242	1100	υ
12672-29-6	Aroclor-1248	5900	
11097-69-1	Aroclor-1254	1100	U
11096-82-5	Aroclor-1260	1100	U

I ah Namas S	Severn Trent Labora	stories-VT	Lab Code: INCHVT		
Contract:	99000		Lab Code:INCHVT Case:PCB	SDG:	KAL086
Phase Type:	SOIL		Lab Sample ID:	381062	
Phase Weight:	10.2	(g)	Date Received: _	03/25/99	
Injection Volume:	1.0	(uL)	Date Extracted: _	04/01/99	
Dilution Factor:	1.0		Date Analyzed: _	04/28/99	
% Solids:	88		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	56	U
11104-28-2	Arocior-1221	56	U
11141-16-5	Aroclor-1232	56	U
63469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	400	
11097-69-1	Arocior-1254	56	U
11096-82-5	Aroclor-12\$0	29	J

Date Analyzed:

Sulfur Clean-up:

(Y/N)

EPA SAMPLE NO. W70310RE Lab Name: Severn Trent Laboratories-VT Lab Code: INCHVT KAL086 99000 PCB Contract: Case: SDG: SOIL 381062R1 Lab Sample ID: Phase Type: 10.0 (g) 03/25/99 Phase Weight: Date Received: 1.0 04/20/99 (uL) Injection Volume: Date Extracted: 04/29/99 1.0

Dilution Factor:

% Solids:

100

CAS NO.	COMPOUND	 C	ONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016		50	U
11104-28-2	Aroclor-1221	 7	50	U
11141-16-5	Aroclor-1232	7	50	U
53469-21-9	Aroclor-1242		50	U
12672-29-6	Aroclor-1248		490	
11097-69-1	Aroclor-1254		50	U
11096-82-5	Arocior-1260		50	U

use original

W7031	1

٠						W70311	
Lab Name:	Severn Trent Labora	itories-VT	Lab Code: .	INCHVT	<u></u>		
Contract:	99000		Case: _	PCB	SDG:	KAL086	
Phase Type:	SOIL		La	b Sample ID:	381063		
Phase Weight:	10.2	(g)	Da	te Received:	03/25/99		
njection Volume:	1.0	(uL)	Da	te Extracted:	04/01/99		
Dilution Factor:	1.0		Da	te Analyzed:	04/29/99		
% Solids:	88		Sulf	iur Clean-up:	N	(Y/	/N)

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER
		ug/Kg	
12674-11-2	Arocior-1016	56	U
11104-28-2	Aroclor-1221	56	U
11141-16-5	Aroclor-1232	56	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	500	
11097-69-1	Aroclor-1254	56	U
11096-82-5	Aroclor-1260	38	J

Lab Name:	Severn Trent Labora	tories-VT	Lab Code: INCHVT		
Contract:	99000		Case: PCB	SDG:	KAL086
Phase Type:	SOIL		Lab Sample ID:	381064	·····
Phase Weight:	10.3	(g)	Date Received:	03/25/99	· · · · · · · · · · · · · · · · · · ·
Injection Volume:	1.0	(uL)	Date Extracted:	04/01/99	
Dilution Factor:	1.0		Date Analyzed:	04/29/99	····
% Solids:	87		Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER	
12674-11-2	Aroclor-1016	56	U	
11104-28-2	Aroclor-1221	56	U	
11141-16-5	Aroclor-1232	56	U	
53469-21-9	Aroclor-1242	56	U	
12672-29-6	Aroclor-1248	56	U	
11097-69-1	Aroclor-1254	56	U	
11096-82-5	Arocior-1260	56	U	

W	77	24	4
	/ U	31	•

						W70314	
Lab Name:	Severn Trent Labora	atories-VT	Lab Code:	INCHVT	L	·····	
Contract:	99000		Case:	PCB	SDG:	KAL086	
Phase Type:	WATER		La	nb Sample ID:	381065		
Phase Weight:	1000.	(mL)	Da	ate Received:	03/25/99		
Injection Volume:	1.0	(uL)	Da	ite Extracted:	03/30/99		
Dilution Factor:	1.0		Da	ate Analyzed:	04/29/99		
% Solids:			Sul	fur Clean-up:	N	(Y	/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.050	DV C
11104-28-2	Aroclor-1221	0.050	TU K
11141-16-5	Aroclor-1232	0.050	ZV VZ
53469-21-9	Aroclor-1242	0.050	R 172
12672-29-6	Aroclor-1248	0.050	n M2
11097-69-1	Aroclor-1254	0.050	D) O
11096-82-5	Aroclor-1260	0.050	R 12

P	BL	KI.	3

						PBLKL3	
Lab Name:	Severn Trent Laborato	ries-VT	Lab Code:	INCHVT	L		
. Contract:	99000	_	Case: _	PCB	SDG:	KAL084	
Phase Type:	SOIL		La	b Sample ID:	PBLKL3	·	
Phase Weight:	10.0	(g)	Da	te Received:			
njection Volume:	1.0	(uL)	Da	te Extracted:	03/30/99		
Dilution Factor:	1.0		Da	te Analyzed:	04/16/99		
% Solids:			Sult	ur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Arocior-1242	50	U
12672-29-6	Aroctor-1248	60	U
11097-69-1	Aroclor-1254	50	U
11096-82-5	Aroclor-1260	50	U

Appendix L

2000 Groundwater Sampling Results

EPA SAMPLE NO.

W74088 Anw-Z

Lab Name: STL Burlington Lab Code: STLVT **KAL290** 20000 20000 SDG: Contract: Case: WATER Lab Sample ID: 438383 Phase Type: 980. (mL) 11/17/00 Phase Weight: **Date Received:** (uL) 1.0 11/21/00 Injection Volume: Date Extracted: 1.0 11/28/00 **Dilution Factor:** Date Analyzed: N (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

EPA SAMPLE NO.

WMW-2

Lab Name: STL Burlington Lab Code: STLVT

Contract: 20000 Case: 20000 SDG: KAL290

438384 WATER Phase Type: Lab Sample ID: 980. 11/17/00 (mL) Phase Weight: Date Received: 11/21/00 1.0 (uL) Injection Volume: Date Extracted: 1.0 11/28/00 Dilution Factor: Date Analyzed: N (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	U	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	0.051	U	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroclor-1248	0.051	U	
11097-69-1-	Aroclor-1254	0,051	υ	
11096-82-5	Aroclor-1260	0.051	U	

EPA SAMPLE NO.

W74090 **KAL290** SDG:

AO1

Lab Name: STL Burlington STLVT Lab Code: 20000 20000 Contract: Case: 438386 WATER Phase Type: Lab Sample ID: (mL) 11/17/00 980. Phase Weight: Date Received: 11/21/00 1.0 Injection Volume: (uL) Date Extracted: **Dilution Factor:** 1.0 11/28/00 Date Analyzed: N (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53459-21-9	Aroclor-1242	0.058	
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254		U
11096-82-5	Aroclor-1260	0.051	U

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EPA SAMPLE NO.

N

(Y/N)

W74091 Lab Name: STL Burlington Lab Code: STLVT 20000 20000 **KAL290** Contract: Case: SDG: WATER 438387 Phase Type: Lab Sample ID: 980. (mL) 11/17/00 Phase Weight: Date Received: Injection Volume: 1.0 (uL) 11/21/00 Date Extracted: 1.0 11/28/00 **Dilution Factor:** Date Analyzed:

Sulfur Clean-up:

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.056	
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	
11096-82-5	Aroclor-1260	0.051	U

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EPA SAMPLE NO.

			i turt	in _s .		W74092	MW 10 B
Lab Name:	STL Burlington		Lab Code:	STLVT			
Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER	·	Lab S	Sample ID:	438385		
Phase Weight:	980.	(mL)	Date	Received:	11/17/00) 	
njection Volume:	1.0	(uL)	Date 1	Extracted:	11/21/00		
Dilution Factor:	1.0		Date .	Analyzed:	11/28/00	!	
% Solids:			Sulfur	Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.028	NLA
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U
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N NTU

EPA SAMPLE NO.

wmw-AA

Lab Name: STL Burlington Lab Code: STLVT 20000 **KAL290** 20000 SDG: Contract: Case: 438388 Phase Type: WATER Lab Sample ID: (mL) 980. 11/17/00 Phase Weight: Date Received: 11/21/00 Injection Volume: 1.0 (uL) Date Extracted: 1.0 11/28/00 **Dilution Factor:** Date Analyzed: (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051		
11104-28-2	Aroclor-1221	-0.033 C.OZ \	10	
11141-16-5	Arocior-1232	0.051	U	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroctor-1248	0.051	U	
11097-69-1	Aroclor-1254	0.051	· · · · · · · · · · · · · · · · · · ·	
11096-82-5	Aroclor-1260	0.051	U	

EPA SAMPLE NO.

W74094	٧
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WMW-AB

,						W74094	
Lab Name: STL Burlington		Lab Code: _	STLVT				
Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER	<u></u>	Lab	Sample ID:	438389		
Phase Weight:	980.	(mL)	Date	e Received:	11/17/00		
Injection Volume:	1.0	(uL)	Date	e Extracted:	11/21/00		
Dilution Factor:	1.0		Date	e Analyzed:	11/28/00		
% Solids:			Sulfu	ır Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	-
11097-69-1	Aroclor-1254	0.051	-
11096-82-5	Aroclor-1260	0.051	υ

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Lab Name: S	TL Burlington		Lab Code:	STLVT	• .	·
Contract:	20000		Case:	20000	SDG:	KAL290
Phase Type:	WATER	<u>. </u>	Lal	b Sample ID:	438390	
Phase Weight:	980.	(mL)	Da	te Received:	11/17/00	
njection Volume:	1.0	(uL)	Dat	te Extracted:	11/21/00	
Dilution Factor:	1.0		Da	te Analyzed:	11/28/00	
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	U	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	0.051	U	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroclor-1248	0.051	U	
11097-69-1	Aroclor-1254		· · · U .	
11096-82-5	Aroctor-1260	0.051	U	

EPA SAMPLE NO.

W74096	Myn
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Lab Name: STL Burlington STLVT Lab Code: 20000 KAL290 20000 Contract: Case: SDG: 438391 WATER Lab Sample ID: Phase Type: 980. (mL) 11/17/00 Phase Weight: Date Received: 1.0 11/21/00 Injection Volume: (uL) Date Extracted: 1.0 11/28/00 **Dilution Factor:** Date Analyzed: % Solids: N (Y/N) Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

	•					W74097
Lab Name: S	TL Burlington		Lab Code:	STLVT		
Contract:	20000		Case:	20000	SDG:	KAL290
Phase Type:	WATER	·	Lab	Sample ID:	438392	
Phase Weight:	980.	(mL)	Dat	e Received:	11/17/00	
jection Volume:	1.0	(uL)	Date	e Extracted:	11/21/00	
Dilution Factor:	1.0		Dat	e Analyzed:	11/28/00	
% Solids:			Sulfu	ır Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroctor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

W74098	Anw-91
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Lab Name:	STL Burlington		Lab Code: _	STLVT		
Contract:	20000		Case:	20000	SDG:	KAL290
Phase Type:	WATER	·	Lat	Sample ID:	438496	
Phase Weight:	970.	(mL)	Dat	te Received:	11/18/00	
Injection Volume:	1.0	(uL)	Dat	e Extracted:	11/22/00	·
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00	
% Solids:			Sulfi	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.052	U
11104-28-2	Aroclor-1221	0.052	U
11141-16-5	Aroclor-1232	- 0.18 -0.05)	u
53469-21-9	Aroclor-1242	0.052	U
12672-29-6	Aroclor-1248	0.052	· U
11097-69-1	Aroclor-1254	0.052	
11096-82-5	Aroclor-1260	0.052	Ū

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W74099	MMM_ 15

Lab Name:	STL Burlington		Lab Code: _	STLVT		
Contract:	20000		Case:	20000	SDG:	KAL290
Phase Type:	WATER	·	Lat	Sample ID:	438495	
Phase Weight:	980.	(mL)	Dat	te Received:	11/18/00	
Injection Volume:	1.0	(uL)	Dat	e Extracted:	11/22/00	•
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00	
% Solids:			Sulfi	ur Clean-up:	N	(A/M)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	<u> </u>
11096-82-5	Aroclor-1260	0.051	U

EPA SAMPLE NO. Anw-18 W74100 Lab Name: STL Burlington Lab Code: STLVT **KAL290** 20000 20000 SDG: Contract: Case: 438497 WATER Phase Type: Lab Sample ID: 11/18/00 (mL) Phase Weight: 980. Date Received: (uL) 11/22/00 1.0 Injection Volume: Date Extracted: 11/28/00 **Dilution Factor:** 1.0 Date Analyzed: (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Arocior-1016	0.051	—————— (
11104-28-2	-Aroclor-1221	0.051	- U
11141-16-5	-Aroclor-1232	0.051	
53469-21-9	Aroclor-1242	0.051	
12672-29-6	_Aroclor-1248	0.061	U
11097-69-1	Aroclor-1254	0.051	
11096-82-5	Aroclor-1260	/ -0.0€1	U

EPA SAMPLE NO.

W74100RE			
SDG:	KAL290		

Lab Name: STL Burlington STLVT Lab Code: 20000 20000 Contract: Case: WATER 438497R1 Phase Type: Lab Sample ID: (mL) 11/18/00 Phase Weight: 980. Date Received: 1.0 11/29/00 Injection Volume: (uL) Date Extracted: Dilution Factor: 1.0 12/04/00 Date Analyzed: (Y/N) % Solids: N Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	50 th	
11104-28-2	Aroclor-1221	0.051	27 CV	
11141-16-5	Aroclor-1232	0.051	A 172	
53469-21-9	Aroclor-1242	0.051	8 V2	
12672-29-6	Aroclor-1248	0.051	N W	
11097-69-1	Aroclor-1254	0.051	TU C	
11096-82-5	Aroclor-1260	0.051	u Va	

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Lab Name: S	TL Burlington		Lab Code:	STLVT			
Contract:	20000		Case:	20000	SDG:	KAL290	_
Phase Type:	WATER	•	Lat	Sample ID:	438498		
Phase Weight:	970.	(mL)	Dat	e Received:	11/18/00	·	
Injection Volume:	1.0	(uL)	Dat	e Extracted:	11/22/00		
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00		
% Solids:			Sulfi	ur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER
	•	ug/L	
12674-11-2	Aroclor-1016	0.052	U
11104-28-2	Aroclor-1221	0.052	Ų
11141-16-5	Aroclor-1232	0.052	U
53469-21-9	Aroclor-1242	0.052	U
12672-29-6	Aroclor-1248	0.052	U
11097-69-1	Aroclor-1254	0.052	
11096-82-5	Aroclor-1260	0.052	U

EPA SAMPLE NO.

W74102

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Lab Name: S	TL Burlington		Lab Code: ST	LVT		
Contract:	20000		Case: 20	000	SDG:	KAL290
Phase Type:	WATER		Lab Sam	ple ID:	438494	·
Phase Weight:	980.	(mL)	Date Rec	eived:	11/20/00	·
Injection Volume:	1.0	(uL)	Date Extr	acted:	11/22/00	
Dilution Factor:	1.0		Date Ana	lyzed:	11/28/00	
% Solids:			Sulfur Clea	an-up:	N	(Y/N)

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CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.11	1.
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

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Lab Name:	STL Burlington		Lab Code: _	STLVT		<u></u>	
Contract:	20000		Case:	20000	SDG:	KAL290	_
Phase Type:	WATER	· .	Lab	Sample ID:	438493		
Phase Weight:	990.	(mL)	Dat	e Received:	11/20/00		
Injection Volume:	1.0	(uL)	Date	e Extracted:	11/22/00		
Dilution Factor:	1.0		Dat	e Analyzed:	11/28/00		
% Solids:			Sulfa	ır Clean-up:	N	٠	Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	
11096-82-5	Aroclor-1260	0.051	U

EPA SAMPLE NO.

N

(Y/N)

·						W74104	My
Lab Name:	STL Burlington		Lab Code: _	STLVT	<u> </u>] 13
Contract:	20000		Case: _	20000	SDG: _	KAL294	_
Phase Type:	WATER		Lat	o Sample ID:	438683	.	
Phase Weight:	990.	(mL)	Dat	te Received:	11/22/0	0	
Injection Volume:	1.0	(uL)	Dat	e Extracted:	11/25/0	0	
Dilution Factor:	1.0		Dat	te Analyzed:	11/29/0	0	

Sulfur Clean-up:

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.066	
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.027	J
11096-82-5	Aroclor-1260	0.051	U



EPA SAMPLE NO.

4105

						W/4105	'
Lab Name: S	TL Burlington		Lab Code:	STLVT			
· Contract: _	20000		Case: _	20000	SDG:	KAL294	
Phase Type:	WATER		Lai	Sample ID:	438682		
Phase Weight:	990.	(mL)	Dar	te Received:	11/22/00		
njection Volume:	1.0	(uL)	Dat	e Extracted:	11/25/00		
Dilution Factor:	1.0		Da	te Analyzed:	11/28/00		
% Solids: _			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
1096-82-5	Aroclor-1260	0.051	U

V74106	Jul-	•
	1 . 19	

ab Name:	STL Burlington		Lab Code: STLVT		Jun
Contract:	20000		Case: 20000	SDG: KAL29	4
Phase Type:	WATER		Lab Sample ID:	438687	_
Phase Weight:	990.	(mL)	Date Received:	11/22/00	<u>.</u>
Injection Volume:	1.0	(uL)	Date Extracted:	11/25/00	
Dilution Factor:	1.0		Date Analyzed:	11/29/00	<u> </u>
% Solids:			Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER
		ug/L	
12674-11-2	Aroclor-1016	0.051	υ
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	υ
53469-21-9	Aroclor-1242	0.051	υ
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	υ
11096-82-5	Aroclor-1260	0.051	U

W74107	NW-WM
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Lab Name:	STL Burlington		Lab Code:	STLVT	<u></u>	
Contract:	20000		Case:	20000	SDG:	KAL294
Phase Type:	WATER		Lal	b Sample ID:	438688	
Phase Weight:	990.	(mL)	Da	te Received:	11/22/00	
Injection Volume:	1.0	(uL)	Dat	te Extracted:	11/25/00	
Dilution Factor:	1.0		Da	te Analyzed:	11/29/00	
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER
		ug/L	
12674-11-2	Aroclor-1016	0.051	Ū
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

W74108	Bn-6
	 •

ab Name:	STL Burlington		Lab Code: _	STLVT	<u> </u>	
Contract:	20000		Case:	20000	SDG:	KAL294
Phase Type:	WATER		Lat	o Sample ID:	438685	
Phase Weight:	990.	(mL)	Dat	te Received:	11/22/00	1
Injection Volume:	1.0	(uL)	Dat	te Extracted:	11/25/00	
Dilution Factor:	1.0		Dat	te Analyzed:	11/29/00	
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

EPA SAMPLE NO.

74109 WMW

Lab Name: S	TL Burlington		Lab Code:	STLVT		
Contract:	20000		Case:	20000	SDG:	KAL294
Phase Type:	WATER		Lat	o Sample ID:	438691	
Phase Weight:	990.	(mL)	· Da	te Received:	11/22/00	
Injection Volume:	1.0	(uL)	Dat	te Extracted:	11/25/00	
Dilution Factor:	1.0		Dat	te Analyzed:	11/29/00	
% Salide:		-	Sulf	ur Clean-un:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	υ
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

W74110	MMW-1
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	STI Dunkington			OTILIT		
ab Name: . Contract:	STL Burlington 20000		Lab Code: _ Case:	20000	SDG:	KAL294
			_			
Phase Type:	WATER		Lai	o Sample ID:	438684	
Phase Weight:	990.	(mL)	Da	te Received:	11/22/00	
njection Volume:	1.0	(uL)	Dat	e Extracted:	11/25/00	
Dilution Factor:	1.0		Da	te Analyzed:	11/29/00	
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	υ
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	

EPA SAMPLE NO.

W74111

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K,	

Lab Name:	STL Burlington		Lab Code:	STLVT		
Contract:	20000		Case:	20000	SDG:	KAL294
Phase Type:	WATER		Lai	b Sample ID:	438686	<u> </u>
Phase Weight:	990.	(mL)	Da	te Received:	11/22/00	
Injection Volume:	1.0	(uL)	Da	te Extracted:	11/25/00	
Dilution Factor:	1.0		Da	te Analyzed:	11/29/00	
% Solids:			Sulf	fur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

EPA SAMPLE NO.

	:	•				W74112		MW 3
b Ñame:	STL Burlington		Lab Code:	STLVT			·	N
Contract:	20000		Case:	20000	SDG:	KAL294	I	
Phase Type:	WATER		Lab Sa	ample ID:	438689			
Phase Weight:	990.	(mL)	Date F	Received:	11/22/00)	_	
njection Volume:	1.0	(uL)	Date E	xtracted:	11/25/00)	_	
Dilution Factor:	1.0		Date A	nalyzed:	11/29/00)		
% Solids:			Sulfur (Clean-up:	N		(Y/N)	

Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	U	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	0.082 0.05/	4	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroclor-1248	0.051	υ	
11097-69-1	Aroclor-1254	0.051	U	
11096-82-5	Aroclor-1260	0.051	U	

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EPA SAMPLE NO.

N

(Y/N)

չab Name: չ	STL Burlington		Lab Code:	STLVT		W74113] Amorri
Contract:	20000		Case:	20000	SDG:	KAL294	
Phase Type:	WATER	·	Lat	Sample ID:	438690		
Phase Weight:	990.	(mL)	Dat	te Received:	11/22/00)	7 \
Injection Volume:	1.0	(uL)	Dat	e Extracted:	11/25/00)	ONTO
Dilution Factor:	1.0		Dat	te Analyzed:	11/29/00)	

Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U.
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.069	Cit
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U U

% Solids:

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# KAL290

PCB ANALYSES

WILLOW BOULEVARD GROUNDWATER SAMPLING

Analyses performed by:

Severn Trent Laboratories Colchester, Vermont

Review performed by:



Blasiand, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the data package for SDG# KAL290 for the analysis of groundwater samples from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

			Sample					
Sample ID	Lab ID	Matrix	Date	VOA	BNA	РСВ	TAL	тос
W74088	438383	water	11/15/00			х		
W74089	438384	water	11/15/00			х		
W74092¹	438385	water	11/15/00			×		
W74090	438386	water	11/15/00			×		
W74091	438387	water	11/15/00			х		
W74093	438388	water	11/16/00			x		
W74094	438389	water	11/16/00			х		
W74095	438390	water	11/16/00			x		
W74096¹	438391	water	11/16/00			x		
W74097	438392	water	11/16/00			х		
W74099	438495	water	11/17/00			x		
W74098	438496	water	11/17/00	<u> </u>		х		
W74100	438497	water	11/17/00			х		
W74101	438498	water	11/17/00			х		
W74103	438493	water	11/18/00			х		
W74102	438494	water	11/18/00			×		
	,							

¹ MS/MSD analysis performed on sample.

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PCB ANALYSES

<u>Introduction</u>

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by STL (formerly known as Aquatec, Inc.) in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of water samples are 5 days from date of sample receipt to extraction and 40 days from extraction to analysis. The technical holding times are 7 days from sample collection to extraction and 40 days to analysis.

All samples were originally extracted and analyzed within the specified holding times. Due to poor surrogate recoveries, sample W74100 was reextracted outside the prescribed holding time. All data for the reextracted sample have been qualified as estimated based on the holding time violation.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No Aroclors were detected in the method blanks. No rinse blanks were submitted with the samples.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibrations were within the specified limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All the continuing calibration standards were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Surrogate recoveries were above control limits in samples W74088, W74089, W74092, W74092MS, W74092MSD, W74090, W74091, W74093, W74094, W74095, W74096, W74096MS, W74096MSD and W74097 and their associated blank and matrix spike blank. Since the matrix spike and matrix spike blank recoveries were also above control limits and since the sample extracts showed no sign of evaporative loss, it is believed that all field samples and associated quality control samples were spiked with twice the normal amount of spiking solution. All surrogate recoveries calculated based on twice the normal concentrations were within control limits. No data have, therefore, been qualified based on the high recoveries.

Recoveries for both surrogates were less than 10 percent in sample W74100. All data for the sample have been rejected based on the recoveries. The sample was later reextracted with one surrogate recovery below control limits. Since recovery for the second surrogate was within control limits, no data have been qualified based on the deviation.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

Aroclor 1221 was reported as present in sample W74093 and Aroclor 1232 was reported as present in sample W74098. An examination of the sample chromatograms, however, showed no evidence of these Aroclors in the samples. Data for the Aroclors have therefore been qualified as undetected. A further examination of the chromatograms showed poor pattern matches for Aroclor 1232 in samples W74092 and W74102. Data for this Aroclor have been qualified as estimated with presumptive evidence of identification based on the poor matches.

All other Aroclors have been correctly identiified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike, matrix spike duplicate and matrix spike blank recoveries were above control limits. Since, as stated above, it is believed that the samples were overspiked, no data have been qualified based on the recoveries.

8. Field Duplicates

Results for field duplicate samples are summarized below:

Sample ID/ Duplicate ID	Analyze	Sample Result	Duplicate Result	RPD*
W74090/W74091	AR-1242	0.058	0.056	3.5%
W74095/W74097	. ND			NA

RPD based on total PCB content.

The field duplicate results are acceptable.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

ND Not detected.

NA Analyze not detected in sample and/or duplicate. RED not applicable.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X	-	
Are the sample numbers included in the narrative?	<u>X</u>		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?	X		
Surrogate Recovery			
Are surrogate recovery forms present?	X		*****
Are all the samples listed on the appropriate surrogate recovery form?	X		/
Were surrogate recoveries outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?	X		
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
_8 out of _8_			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
out of			
Blanks			
Is a Method Blank Summary Form present?	X		••••
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/instrument blanks have positive results?		X	
Are there field/rinse blanks associated with every sample?		X	
Do any field/rinse blanks have positive results?			X
Calibration and GC Performance			
Are the following chromatograms and data printouts present?	•		
Aroclor 1016	X		
Aroclor 1221	X		
Aroclor 1232	X		

PCB Data Review Checklist - Page 2

	YES	NO_	NA
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Aroclor 1260	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	x		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		•
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	x	-	
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?		_x_	
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?			
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			Х
Compound Quantitation and Reported Detection Limits			
Are the reporting limits adjusted to reflect sample dilutions, and, for soils, sample moisture?	x		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?	X		
·			

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates				
		TCX-1	TCX-2	DCB-1	DCB-2	
W74088		1	1	1	ţ	
W74089		1	1	t	1	
W74092		t	1	t	t	
W74090		1	1	1	1	
W74091		1	1	t	ı	
W74093		1	1	1	t	
W74094		1	1			
W74095				ı	1	
W74096		1	1	ī	1	
W74097		ı	ī	1	t	
W74103						
W74102						
W74099						
W74098						
W74100			1	1		
W74101						
W74092MS		ı	1	<u> </u>	1	
W74092MSD				t	t	
W74096MS		1	1	t		
W74096MSD				ţ	t	
W74100RE	+6	ı				
					····	
					-	

Surrogate Standards TCX Tetrachioro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out

Recovery high Recovery low t

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP2620</u> Column: <u>RTX-5 / RTX-35</u>

Date:	11/27/00	11/28/00	11/28/00	11/28/00	11/28/00	11/28/00	11/28/00	11/28/00
Time:	11/27/00	5:39	6:02	11:03	11:26	14:09	14:32	17:44
	Initial Cal	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D						
Arocior 1016	ok							
Aroclor 1221	ok			<u> </u>				
Aroclor 1232	ok							
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok		ok		ok		ok
Aroclor 1254	ok				ok			
Aroclor 1260	ok						ok	
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								
		1						

PCB Calibration Summary - Page 2

Instrument: <u>HP2620</u> Column: <u>RTX-5 / RTX-35</u>

Date:		11/28/00						
Time:		18:07		ere De la Transport				
	Initial Cal	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016								
Aroclor 1221								
Aroclor 1232								
Aroclor 1242		ok						
Arocior 1248								
Aroclor 1254								
Aroclor 1260								
Tetrachloro-m-xylene								
Decachlorobiphenyl								
Affected Samples:								
,								

PCB Calibration Summary - Page 3

Instrument: <u>HP2865</u> Column: <u>RTX-5 / RTX-35</u>

Date:	11/27/00	12/4/00	12/4/00	12/4/00	12/4/00	12/4/00	12/4/00	
Time:	11/28/00	8:56	9:19	11:34	11:56	15:56	16:18	
	Initial Cal.	Cont. Cal.						
	%RSD	%D						
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok		ok					<u> </u>
Aroclor 1248	ok	ok		ok		ok		
Aroclor 1254	ok				ok			
Aroclor 1260	ok					<u> </u>	ok	
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:]		<u> </u>			
	-							·

CORRECTED ANALYSIS SUMMARY FORMS

; 	CTI Dudington		Lab Carta	eti ve		W74088
Lab Name:	STL Burlington		Lab Code: _	STLVT	<u> </u>	
Contract:	20000		Case: _	20000	SDG:	KAL290
Phase Type:	WATER		Lai	o Sample ID:	438383	
Phase Weight:	980.	(mL)	Da	te Received:	11/17/00	
jection Volume:	1.0	(uL)	Dat	e Extracted:	11/21/00	
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00	
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	. 0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	υ
1097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

Lah Namer S	TL Burlington		Lab Code:	STLVT	W74089			
Lab Name:			-		<u> </u>		لـــــــــــــــــــــــــــــــــــــ	
Contract: _	20000		Case: _	20000	SDG:	KAL290		
Phase Type:	WATER		Lal	o Sample ID:	438384			
Phase Weight:	980.	(mL)	Da	te Received:	11/17/00			
jection Volume:	1.0	(uL)	Dat	e Extracted:	11/21/00			
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00			
% Solids: _			Sulfi	ur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

						W74090	
Lab Name:	STL Burlington		Lab Code:	STLVT	<u></u>		
Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER		Lai	b Sample ID:	438386		
Phase Weight:	980.	(mL)	Da	te Received:	11/17/00		
jection Volume:	1.0	(uL)	Dat	te Extracted:	11/21/00		
Dilution Factor:	1.0		Da	te Analyzed:	11/28/00		
% Solids:			Sulf	ur Clean-up:	N	(Y/A	4)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	Ü
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.058	
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

						W74091	
Lab Name:	STL Burlington		Lab Code: _	STLVT	L		
Contract:	20000		Case: _	20000	SDG:	KAL290	
Phase Type:	WATER		Lat	o Sample ID:	438387		
Phase Weight:	980.	(mL)	Dat	te Received:	11/17/00	·	
jection Volume:	1.0	(uL)	Dat	e Extracted:	11/21/00		
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00		
% Solids:			Sulfi	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.056	
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	- Aroclor-1254	0.051	
11096-82-5	Aroclor-1260	0.051	U

						W74092	
Lab Name: S	TL Burlington		Lab Code:	STLVT			
Contract:	20000		Case: _	20000	SDG:	KAL290	· · · · ·
Phase Type:	WATER	·	Lal	o Sample ID:	438385		
Phase Weight:	980.	(mL)	Da	te Received:	11/17/00		
jection Volume:	1.0	(uL)	Dat	e Extracted:	11/21/00		
Dilution Factor:	1.0		Da	te Analyzed:	11/28/00		
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.028	NLA
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

t oh Nomes	STL Burlington		Lab Cadas	STLVT		W74093	
, Lao Name:	31C Burnington		Lab Code: _	SILVI	L	. 	
Contract:	20000		Case:	20000	SDG:	KAL290)
Phase Type:	WATER		Lab	Sample ID:	438388		
Phase Weight:	980.	(mL)	Date	e Received:	11/17/00		
njection Volume:	1.0	(uL)	Date	Extracted:	11/21/00		
Dilution Factor:	1.0	 _	Date	e Analyzed:	11/28/00		
% Solids:			Sulfu	r Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	υ	
11104-28-2	Arocior-1221	0.033 C.OZ /	AU	
11141-16-5	Aroclor-1232	0.051	U	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroclor-1248	0.051	U	
11097-69-1	Aroclor-1254	0.051	U	
11096-82-5	Aroclor-1260	0.051	U	

						W74094	
Lab Name: STL Burlington			Lab Code:	STLVT	L	 	
Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER	·	Lal	b Sample ID:	438389		
Phase Weight:	980.	(mL)	Da	te Received:	11/17/00)	
jection Volume:	1.0	(uL)	Dat	te Extracted:	11/21/00)	
Dilution Factor:	1.0		Da	te Analyzed:	11/28/00)	
% Solids:			Sulf	ur Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	Ü
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Arocior-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
1097-69-1	Aroclor-1254	0.051	
11096-82-5	Aroclor-1260	0.051	U

						W74095	
Lab Name:	STL Burlington		Lab Code:	STLVT			
Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER	<u>. </u>	Lai	o Sample ID:	438390		
Phase Weight:	980.	(mL)	Date Received: Date Extracted: Date Analyzed:		11/17/00	· · · · · · · · · · · · · · · · · · ·	
jection Volume:	1.0	(uL)			11/21/00		
Dilution Factor:	1.0				11/28/00		
% Solids:			Sulfi	ur Clean-up:	N	(Y.	/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	U	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	. 0.051	U	
53469-21-9	Aroclor-1242	0.051	บ	
12672-29-6	Aroclor-1248	0.051	U	
11097-69-1	Aroclor-1254		U	
11096-82-5	Aroclor-1260	0.051	U	

t ah Nama	STL Burlington	·	l ab Cada	STLVT		W74096
Contract:	20000		Lab Code: _ Case:	20000	SDG:	KAL290
Phase Type:	WATER		Lai	Sample ID:	438391	
Phase Weight:	980.	(mL)	Da	te Received:	11/17/00	
jection Volume:	1.0	(uL)	Date Extracted:		11/21/00	
Dilution Factor:	1.0	<u>. </u>	Dat	te Analyzed:	11/28/00	
% Solids:			Sulfi	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	υ
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	
11096-82-5	Arocior-1260	0.051	U

l ah Namo	STL Burlington		Lab Code:	STLVT		W74097
Contract:	20000		Case:	20000	SDG:	KAL290
Phase Type:	WATER	<u> </u>	Lat	b Sample ID:	438392	
Phase Weight:	980.	(mL)	Dat	te Received:	11/17/00	
njection Volume:	1.0	(uL)	Dat	te Extracted:	11/21/00	
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00	
% Solids:			Sulfu	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	υ
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U .
11096-82-5	Aroctor-1260	0.051	U

						W74098	
Lab Name: <u>S</u>	TL Burlington		Lab Code:	STLVT			
Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER	· ·	Lat	o Sample ID:	438496		
Phase Weight:	970.	(mL)	Dat	te Received:	11/18/00		
jection Volume:	1.0	(uL)	Dat	e Extracted:	11/22/00		
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00		
% Solids:			Sulfi	ur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.052	U
11104-28-2	Aroclor-1221	0.052	U
11141-16-5	Aroclor-1232	-0.18 O.OSZ	u
53469-21-9	Aroclor-1242	0.052	U
12672-29-6	Aroctor-1248	0.052	υ
1097-69-1	Aroclor-1254	0.052	- U ·
11096-82-5	Aroclor-1260	0.052	Ū

Lab Name: STL Burlington			Lab Code:	STLVT	W74099		
Contract:	20000		Case:	20000	SDG:	KAL290	<i>-</i>
Phase Type:	WATER	-	Lal	o Sample ID:	438495		
Phase Weight:	980.	(mL)	Dat	te Received:	11/18/00		
njection Volume:	1.0	(uL)	Date Extracted:		11/22/00		
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00		
% Solids:			Sulfi	ur Clean-up:	N	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U
		1	1

Lab Name: Contract:	STL Burlington		Lab Code: Case:	STLVT 20000	SDG:	V74100 KAL290	
Phase Type:	WATER	<u></u>	-	b Sample ID:	438497		_
Phase Weight:	980.	(mL)	Da	te Received:	11/18/00		
Injection Volume:	1.0	(uL)	Dat	te Extracted:	11/22/00		
Dilution Factor:	1.0		Da	te Analyzed:	11/28/00		,
% Solids:			Sulf	ur Clean-up:	Ŋ	(Y/N)	
CASNO		COMPOUND		CON	CENTRATION		OUAL IEIED

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	
11104-28-2	- Aroclor-1221		- v V
11141-16-5	Aroclor-1232	0.051	U V
53469-21-9	Aroclor-1242	0.051	U (
12672-29-6	- Aroclor-1248	0.051	
11097-69-1	Aroclor-1254	0.051	
11096-82-5	Aroclor-1260	0.051	U

	,					W74100RE	
Lab Name:	STL Burlington		Lab Code:	STLVT			
Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER		Lal	b Sample ID:	438497R	1	
Phase Weight:	980.	(mL)	Da	te Received:	11/18/00)	
njection Volume:	1.0	(uL)	Dat	te Extracted:	11/29/00)	
Dilution Factor:	1.0		Da	te Analyzed:	12/04/00)	
% Solids:			Sulf	ur Clean-up:	N	(Υ	/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	SU W
11104-28-2	Aroclor-1221	0.051	10 VJ
11141-16-5	Aroclor-1232	0.051	18 M
53469-21-9	Aroclor-1242	0.051	म ५५
12672-29-6	Aroclor-1248	0.051	12 A
11097-69-1	Aroclor-1254	0.051	DUJ
11096-82-5	Aroclor-1260	0.051	W W

•						14774404		1
Lab Name:	STL Burlington		Lab Code:	STLVT		W74101		
Contract:	20000		Case: _	20000	SDG:	KAL290		_
Phase Type:	WATER	·	Lai	o Sample ID:	438498			
Phase Weight:	970.	(mL)	Da	te Received:	11/18/00			
jection Volume:	1.0	(uL)	Dat	e Extracted:	11/22/00			
Dilution Factor:	1.0		Da	te Analyzed:	11/28/00			
% Solids:			Sulf	ur Clean-up:	N	ſ	Y/N)	

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.052	11
11104-28-2	Aroclor-1221	0.052	
11141-16-5	Aroclor-1232	0.052	U
53469-21-9	Aroclor-1242	0.052	U
12672-29-6	Aroclor-1248	0.052	U
11097-69-1	Aroclor-1254	0.052	U
11096-82-5	Aroclor-1260	0.052	U

· · · · · · · · · · · · · · · · · · ·	CTI Double and			0711/57		W74102
Lab Name:	STL Burlington		Lab Code: _	STLVT		
Contract:	20000		Case:	20000	SDG:	KAL290
Phase Type:	WATER		Lab	Sample ID:	438494	
Phase Weight:	980.	(mL)	Date	Received:	11/20/00	
Injection Volume:	1.0	(uL)	Date	Extracted:	11/22/00	···
Dilution Factor:	1.0		Date	Analyzed:	11/28/00	
% Solids:			Sulfu	r Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	υ
11141-16-5	Aroclor-1232	0.11	17,
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

				,		11574400	
Lab Name:	STL Burlington		Lab Code:	STLVT		W74103	
Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER	·	Lat	o Sample ID:	438493		
Phase Weight:	990.	(mL)	Dat	te Received:	11/20/00		
jection Volume:	1.0	(uL)	Dat	e Extracted:	11/22/00)	
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00		
% Solids:			Sulfi	ur Clean-up:	N	0	Y/N)

ÇAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

)

SUPPORTING DOCUMENTATION



STL Burlington 208 South Park Drive Suite 1 Colchester, VT 05446

Tel: 802 655 1203 Fax: 802 655 1248 www.stf-inc.com

December 7, 2000

Ms. Laurie Indick Blasland & Bouck Engineers 6723 Towpath Road Box 66 Syracuse, NY 13214

Re: Laboratory Project No. 20000

Case: 20000; SDG: KAL290

Dear Ms. Indick:

Enclosed are the analytical results of samples received intact by Severn Trent Laboratories on November 17, 18, and 20, 2000. Laboratory numbers have been assigned and designated as follows:

<u>Lab ID</u>	Client <u>Sample ID</u>	Sample <u>Date</u>	Sample <u>Matrix</u>
	Received: 11/17	7/00 ETR No: 806	589
438383	W74088	11/15/00	Liquid
438384	W74089	11/15/00	Liquid
438385	W74092	11/15/00	Liquid
438385MS	W74092MS	11/15/00	Liquid
438385MD	W74092MSD	11/15/00	Liquid
438386	W74090	11/15/00	Liquid
438387	W74091	11/15/00	Liquid
438388	W74093	11/16/00	Liquid
438389	W74094	11/16/00	Liquid
438390	W74095	11/16/00	Liquid
438391	W74096	11/16/00	Liquid
438391MS	W74096MS	11/16/00	Liquid
438391MD	W74096MSD	11/16/00	Liquid
438392	W74097	11/16/00	Liquid
	Received: 11/13	8/00 ETR No: 807	710
438495	W7 4099	11/17/00	Liquid
438496	W74098	11/17/00	Liquid
438497	W74100	11/17/00	Liquid
438498	W74101	11/17/00	Liquid



STL Burlington

<u>Lab ID</u>	Client	Sample	Sample
	Sample ID	<u>Date</u>	<u>Matrix</u>
	Received: 11/	20/00 ETR No: 80	708
438493	W74103	11/18/00	Liquid
438494	W74102	11/18/00	Liquid

The PCB Aroclor extractions of ten field samples, and two QC sets, associated with the 'Z9' batch exhibited elevated surrogate and matrix spike recoveries. A careful examination of the extracts did not indicate the presence of any evaporative concentration during extract storage. The laboratory suspects that these samples were fortified with twice the routine amount of surrogate and matrix spikes. Associated samples W74092 and W74093 exhibited the presence of target Aroclors 1232 and 1221, respectively, at concentrations below reporting limit. Samples W74090 and W74091 exhibited the presence of Aroclor 1242 at concentrations slightly above reporting limit.

The original PCB Aroclor analysis of sample W74100, associated with the 'A8' batch, exhibited surrogate recoveries below control criteria. This sample was re-extracted on the 'C9' batch and analyzed yielding generally acceptable results. All of the samples and the blank and LCS in the A8 batch exhibited acceptable spike recoveries. The LCS associated with the C9 batch exhibited an elevated spike response.

If there are any questions regarding this submittal, please contact James Madison at (802) 655-1203.

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This report is sequentially numbered starting with page 0001 and ending with page 1001.

I certify that this package is in compliance with the NELAC requirements, both technically and for completeness, for other than the conditions detailed above. The release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Sincerely,

Christopher A. Ouellette Laboratory Director

CAO/mpg Enclosure

FORM 2 AROCLOR SURROGATE RECOVERY

Lab Name:	STL Burlington	Contract:	20000
ab Code:	STLVT	Case:	20000
SAS No:		SDG:	KAL290

EPA	TCX	1	TCX	2	DCB	1	DCB	2
SAMPLE NO.	% RE	C #	% RI	EC #	% RI	EC #	% RE	EC #
PBLKZ9	151	•	153	•	195	•	197	*
PBLKA8	75		75		81		81	
PLCSA8	69		70		93		95	
W74088	192	•	195	•	194	*	196	*
W74089	. 197	•	202	*	196	•	199	*
W74092	166	*	163	*	178	*	180	•
W74090	182	•	180	•	191	*	194	*
W74091	163	*	165		159	•	162	*
W74093	175	*	174	•	160	•	160	*
W74094	154	•	153	*	143		146	
W74095	156	*	150		188	*	189	*
W74096	167	•	167	•	176	•	177	*
W74097	180		183	•	169	•	172	+
W74103	73		77		90		91	
W74102	74		76		92		93	
W74099	79		79		86		87	
W74098	· 74		72		86		86	
W74100	3	•	4	•	6	•	6	*
W74101	79		78		90		91	
PLCSZ9	189	•D	195	*D	204	* D	209	*D
W74092MS	157	•D	154	*D	180	*D	180	^ D
W74092MSD	141	D	139	D	167	* D	168	*D
W74096MS	161	- D	156	*D	151	* D	152	* D
W74096MSD	140	D	136	D	158	*D	162	*D

Project Specific

QC Limits

(60 - 150)

(60 - 150)

TCX = Tetrachloro-meta-Xylene DCB = Decachlorobiphenyl

- Column to be used to flag recovery values

- * Values outside of QC limits
- D Surrogates calculated using diluted analysis
- A Extracted surrogates diluted out, surrogates added to diluted extract as retention time markers.

FORM 2 AROCLOR SURROGATE RECOVERY

l ab Name:	STL Burlington	Contract:	20000
o Code:	STLVT	Case:	20000
SAS No:		SDG:	KAL290

EPA SAMPLE NO.	TCX % RI	1 EC #	TCX % RI	2 EC #	DCB % R	1 EC #	DCB % RE	2 EC #	
PBLKC9	43	•	47	•	81		87		
W74100RE	59	•	63		76	· · · · · · · · · · · · · · · · · · ·	81		
PLCSC9	40	*D	37	*D	78	D	85	D	

Project Specific QC Limits (60 - 150) (60 - 150)

TCX = Tetrachloro-meta-Xylene DCB = Decachlorobiphenyl

- 1 Column to be used to flag recovery values
- * Values outside of QC limits
- D Surrogates calculated using diluted analysis
- A Extracted surrogates diluted out, surrogates added to diluted extract as retention time markers.

AROCLOR MATRIX SPIKE RECOVERY

Lab Name:	STL Burlington		Contract:	20000
b Code:	STLVT	<u> </u>	Case:	20000
SAS No:		<u> </u>	SDG:	KAL290
EPA SAMP	PLE NO.:	W74092		

Compound	SPIKE ADDED ug/L	SAMPLE CONCENTRATION ug/L	MS CONCENTATION ug/L	MS % REC #	QC LIMITS REC.
Aroclor 1242	0.51	0	1.48	290 *	39-150
Aroclor 1254	0.51	0	1.56	306 *	29-131

			_	
Spike Recovery	. 2	out of	2	outside limits

^{# -} Column used to flag recovery and RPD values with an asterisk * - Values outside of QC limits.

FORM 3 AROCLOR MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:	STL Burlington		Contract:	20000	
≟ab Code:	STLVT	-	Case:	20000	_
SAS No:		-	SDG: _	KAL290	_
EPA SAMPI	LE NO.:	W74092			

Compound	ŠPIKE ADDED ug/L	MSD CONCENTRATION ug/L	MSD % REC #	RPD #	QC LIMITS RPD	QC LIMITS REC.
Aroclor 1242	0.51	1.46	286 *	1	30	39-150
Aroclor 1254	0.51	1.53	300 *	2	30	29-131

- Column used to flag recovery and RPD values with an asterisk
* - Values outside of QC limits.

RPD:	00	out of	2	outside limits
Spike Recovery:_	2	out of	2	outside limits

FORM 3 AROCLOR MATRIX SPIKE RECOVERY

Lab Name:	STL Burlington		Contract:	20000	
ib Code:	STLVT	-	Case:	20000	_
SAS No:		_	SDG: _	KAL290	_
EPA SAMP	LE NO.:	W74096			

Compound	SPIKE ADDED ug/L	SAMPLE CONCENTRATION ug/L	MS CONCENTATION ug/L	MS % REC #	QC LIMITS REC.
Aroclor 1242	0.51	0	1.52	298 *	39-150
Aroclor 1254	0.51	0	1.57	308 *	29-131

			_	
Spike Recovery:	2	out of	2	outside limits

^{# -} Column used to flag recovery and RPD values with an asterisk * - Values outside of QC limits.

FORM 3 AROCLOR MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:	STL Burlington	·	Contract:	20000	
Lab Code:	STLVT	_	Case:	20000	
SAS No:		_	SDG:	KAL290	_
EPA SAMPI	LE NO.:	W74096			

Compound	SPIKE ADDED ug/L	MSD CONCENTRATION ug/L	MSD % REC #	RPD #	QC LIMITS RPD	QC LIMITS REC.
Aroclor 1242	0.51	1.55	304 *	2	30	39-150
Aroclor 1254	0.51	1.57	308 *	0	30	29-131

- Column used to flag recovery and RPD values with an asterisk * - Values outside of QC limits.

RPD:	0	out of	2	outside limits
Spike Recovery:	2	out of	2	outside limits

FORM 3E AROCLOR MATRIX SPIKE BLANK RECOVERY

Lab Name:	STL Burlington		Contract:	20000	
cab Code:	STLVT	_	Case:	20000	
SAS No:		_	SDG: _	KAL290	
EPA SAMPI	_E NO.:	PLCSZ9			•

Compound	SPIKE ADDED ug/L	MSB CONCENTRATION ug/L	MSB % REC #	QC LIMITS REC.
Aroclor 1242	0.50	1.50	300 *	39-150
Aroclor 1254	0.50	1.54	308 *	29-131

- Column used to flag recovery and RPD values with an asterisk

* - Values outside of QC limits.

Spike Recovery:	2	out of	2	outside limits
-----------------	---	--------	---	----------------

FORM 3E **AROCLOR** MATRIX SPIKE BLANK RECOVERY

ab Name:	STL Burlington		Contract:	20000	
Lab Code:	STLVT		Case:	20000	
SAS No:			SDG:	KAL290	
EPA SAMPL	E NO.:	PLCSC9			•

Compound	SPIKE ADDED	MSB CONCENTRATION	MSB % REC #	QC LIMITS REC.
Aroclor 1242	ug/L 0.50	ug/L 2.11	422*	39-150
Aroclor 1254	0.50	3.95	790 *	29-131

- Column used to flag recovery and RPD values with an asterisk * - Values outside of QC limits.

Spike Recovery: 2 out of 2 outside limits.

FORM 3E AROCLOR MATRIX SPIKE BLANK RECOVERY

ab Name:	STL Burlington		Contract:	20000	
Lab Code:	STLVT		Case:	20000	
SAS No:			SDG: _	KAL290	
EPA SAMPI	LE NO.:	PLCSA8			

Compound	SPIKE ADDED ug/L	MSB CONCENTRATION ug/L	MSB % REC #	QC LIMITS REC.
Aroclor 1242	0.50	0.46	92	39-150
Aroclor 1254	0.50	0.47	94	29-131

- Column used to flag recovery and RPD values with an asterisk * - Values outside of QC limits.

Spike Recovery: 0 out of 2 outside limits.

FORM 4 AROCLOR METHOD BLANK SUMMARY

ำb Name:	STL Burlington	Contract:	20000
ab Code:	STLVT	Case:	20000
Lab Sample ID:	PBLKZ9	SDG:	KAL290
Matrix:	WATER	308.	
Date Extracted:	11/21/00	Level:	LOW
ate Analyzed(1):	11/28/00	Date Analyzed(2):	11/28/00
ne Analyzed(1):	01:01	Time Analyzed(2):	01:01
GC ID(1):	HP2620	GC ID(2):	HP2620
GC Column(1):	RTX-5	GC Column(2):	RTX-35

LAB ID	CLIENT ID	DATE ANALYZED 1	DATE ANALYZED 2
438383	W74088	11/28/00	11/28/00
438384	W74089	11/28/00	11/28/00
438385	W74092	11/28/00	11/28/00
438386	W74090	11/28/00	11/28/00
438387	W74091	11/28/00	11/28/00
438388	W74093	11/28/00	11/28/00
438389	W74094	11/28/00	11/28/00
438390	W74095	11/28/00	11/28/00
438391	W74096	11/28/00	11/28/00
438392	W74097	11/28/00	11/28/00
PLCSZ9	PLCSZ9	11/28/00	11/28/00
438385MS	W74092MS	11/28/00	11/28/00
438385MD	W74092MSD	11/28/00	11/28/00
438391MS	W74096MS	11/28/00	11/28/00
438391MD	W74096MSD	11/28/00	11/28/00

Lab Name:	STL Burlington		Lab Code:	STLVT	PBLKZ9	
Contract:	20000		Case:	20000	SDG:	KAL290
Phase Type:	WATER		Lai	o Sample ID:	PBLKZ9	I
Phase Weight:	1000.	(mL)	Da	te Received:		
njection Volume:	1.0	(uL)	Dat	e Extracted:	11/21/00	
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00	
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER
	•	ng/F	
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	υ
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Arocior-1248	0.050	U
11097-69-1	Aroclor-1254	. 0.050	υ
11096-82-5	Aroclor-1260	0.050	U

FORM 4 AROCLOR METHOD BLANK SUMMARY

Lab Name:	STL Burlington	Contract:	20000	
Lab Code:	STLVT	Case:	20000	
Lab Sample ID:	PBLKA8	- SDG:	KAL290	
Matrix:	WATER	-	LOW	
Date Extracted:	11/22/00	Level:	11/28/00	
Date Analyzed(1):	11/28/00	Date Analyzed(2):		
ime Analyzed(1):	01:48	Time Analyzed(2):	01:48	
GC ID(1):	HP2620	GC ID(2): _	HP2620	
GC Column(1):	RTX-5	GC Column(2):	RTX-35	

LAB ID	CLIENT ID	DATE ANALYZED 1	DATE ANALYZED 2
PLCSA8	PLCSA8	11/28/00	11/28/00
438493	W74103	11/28/00	11/28/00
438494	W74102	11/28/00	11/28/00
438495	W74099	11/28/00	11/28/00
438496	W74098	11/28/00	11/28/00
438497	W74100	11/28/00	11/28/00
438498	W74101	11/28/00	11/28/00

-		•					
<u>.</u>						PBLKA8	
Lab Name:	STL Burlington	<u> </u>	Lab Code:	STLVT	[
. Contract:	20000		Case:	20000	SDG:	KAL290	
Phase Type:	WATER		Lal	o Sample ID:	PBLKA	} 	
Phase Weight:	1000.	(mL)	Da	te Received:			
jection Volume:	1.0	(uL)	Dat	e Extracted:	11/22/00)	
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00	l 	
% Solids:			Sulf	ur Clean-up:	N	(Y	/N)

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER	
		ug/L		
12674-11-2	Aroclor-1016	0.050	Ū	
11104-28-2	Aroclor-1221	0.050	U	
11141-16-5	Aroclor-1232	0.050	U	
53469-21-9	Aroclor-1242	0.050	U	
12672-29-6	Aroclor-1248	0.050	U	
11097-69-1	Aroclor-1254	0.050	Ū	
11096-82-5	Aroclor-1260	0.050	υ	
		1		

FORM 4 AROCLOR METHOD BLANK SUMMARY

l ab Name:	STL Burlington	Contract:	20000
ab Code:	STLVT	- Case:	20000
Lab Sample ID:	PBLKC9	SDG:	KAL290
Matrix:	WATER	-	LOW
Date Extracted:	11/29/00	Level:	12/04/00
Date Analyzed(1):	12/04/00	Date Analyzed(2):	
ime Analyzed(1):	09:41	Time Analyzed(2):	09:41
GC ID(1):	HP2865	GC ID(2):	HP2865
GC Column(1):	RTX-5	GC Column(2):	RTX-35
		- -	

LAB ID	CLIENT ID	DATE ANALYZED 1	DATE ANALYZED 2
438497R1	W74100RE	12/04/00	12/04/00
PLCSC9	PLCSC9	12/04/00	12/04/00

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

•			. -			PBLKC9	
Lab Name:	STL Burlington		Lab Code:	STLVT	L		
Contract:	20000	· · · · · · ·	Case: _	20000	SDG: _	KAL290	
Phase Type:	WATER		Lal	o Sample ID:	PBLKCS)	
Phase Weight:	1000.	(mL)	Da	te Received:			
njection Volume:	1.0	(uL)	Dat	e Extracted:	11/29/00		
Dilution Factor:	1.0		Dat	te Analyzed:	12/04/00		
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
11096-82-5	Aroclor-1260	0.050	U

Aroclor Calibration Summary Calibration of 27-Nov-2000 11:09 through 28-Nov-2000 00:38. MCD1:[8080] 01,02 27NOV000957 METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

Peak #	RT	Aroclor	1221	Aroclor	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
1	3.798	3.926	7.7%	3.693	4.5%	4.043	6.91	3.605	3.21	3.373	10.2%	3.412	13.21	3.770	4.9
2	3.996	1.570	5.9%	1.487		1.657	6.5%	1.499	• • • •	1.391	8.2%	1.392		1.590	
3	4.427	85.616	10.2%	49.744	9.6%	2.389	14.7%	2.095	11.71	0.289				0.167	
4	5.706	91.593	2.1%	60.442	2.5%	26.522	2.4	21.979	1.51	1.496					
5	5.889	77.286	2.3%	59.492	3.0%	43.734	2.3%	36.779	2.14	9.311	2.8%	7.786	6.1	7.904	5.8%
6	5.995	229.075	4.18	193.789	4.5%	175.245	3.8%	140.998	3.91	14.102	2.8%	2.178	5.21	1.666	8.71
7	6.378	1.562		9.462	2.61	23.586	2.1%	17.726	2.5%	4.994	4.7%	0.387	2.4.	0.268	0,,,
8	6.736	19.364	2.3%	11.113							•	0.201			
9	6.790	17.139		110.086	5.5%	261.301	6.5	202.670	6.7%	110.047	5.8%	4.275		2.339	
10	6.834	45.452	16.	90.736	8.4%	188.734	7.9%	148.202	10.7%			5.904	64.	4.987	
11	7.010	2.823	6.2%	11.947	2.51	28.307	2.3%	21.347	2.0%	5.187	4.7%	0.276		0.153	
12	7.189	13.679	3.1%	91.569	2.0%	223.563	2.21	170.592	2.9%	70.970	1.2	3.264	12.5	1.864	
13	7.406	4.569	7.0%	4.365	10.4%	4.873	8.6%	4.375	8.3	4.198	9.5%	4.341	7.9%	4.385	11.6%
14	7.549	3.778		21.797	3.1%	54.679	2.8	40.552	2.1	12.972	3.78	0.668		0.423	
15	7.610	3.526	2.71	12.967	3.21	30.497	3.91	22.859	2.8%	3.841	3.5%	0.404		0.297	
16	7.740							,		175.601		6.040	6.7%		
17	7.770	20.401	3.8%	171.450	4.5%	447.167	3.4%	334.247	3.8%	189.558	4.5%			2.715	10.1%
. 18	8.001	18.807	24.	111.840	3.0%	271.195	3.7%	205.614	3.5%	108.514	8.9%	11.215	63.	7.481	
19	8.178	7.459	5.7%	57.448	4.3%	151.706	5.7%	112.410	5.5%	54.012	4.7%	1.584	12.4%	0.774	
20	8.307	0.977		17.495	3.8%	50.548	2.2	37.811	2.9%	47.452	2.48	1.760	31.	0.476	
21	8.496			6.416	0.8%	18.230	1.0%	13.647	1.2%	18.424	1.2%				
22	8.561	7.775	37.	60.015	6.4%	157.698	5.7%	125.159	6.5%	231.703	6.0%	183.581	6.78	13.053	21.
23	8.672	2.544	3.5%	52.873	1.9%	146.825	2.2	112.627	2.4	178.860	2.6%	46.349	2.71	1.204	
24	8.751											7.395	3.5%		
25	8.770	1.183		31.487	1.5%	89.465	1.5%	68.436	1.9%	99.451	1.1%			0.679	
26	8.988	0.554		1.089	12.9%	1.564	25.	1.790	20.	0.342		0.308		0.346	
27	9.087	3.801	4.3%	67.898	1.5%	184.234	1.2%	145.763	1.6%	256.219	1.4%	95.907	2.7%	1.805	5.6
28	9.182	4.014	10.5%	45.367	2.2%	94.108	1.2	90.647	2.2%	99.699	1.4%	7.190	13.4%	0.831	
29	9.408	2.449	7.2	60.184	1.9%	144.235	2.1%	132.798	2.3%	215.172	2.0%	31.493	4.1%	1.261	
30	9.544			0.943		2.379	18.	1.977	19.	4.123	13.4%	1.963			
31	9.628	0.698		17.397	1.7%	32.587	1.3%	36.784	1.9%	57.532	1.3%	6.347	4.1%	0.403	
32	9.750	0.140		2.796	4.3%	2.526	5.8%	5.817	3.1%	5.309	1.6%	0.662		*	
. 33	9.901	0.118		2.660	2.4%	1.723	3.0%	6.071	2.9%	9.687	3.0%	1.347	6.7%	0.068	
34	10.006	1.444		33.885	3.2*	14.444	3.1%	76.291	3.7%	131.871	3.7%	29.445	5.1%	0.647	
35	10.101	3.940	3.3	63.240	1.9%	23.362	2.2	139.143	2.5%	268.661	2.2	129.866	4.81	1.877	7.91
36	10.217	7.168	2.7%	66.929	2.1%	25.732	0.5%	146.245	2.6%	278.268	2.5	290.167	3.8	116.439	
37	10.404	0.686		4.400	9.5	3.008	10.0%	11.374	1.8%	30.872	1.4%	45.186	1.8	0.369	
38	10.682	2.960	3.0%	51.118	3.4%	4.864	4.0%	114.490	6.4	202.988	6.2	85.061	3.5%	18.143	2.9%
39	10.837	7.220	4.7%	19.539	2.41	3.664	10.2%	49.215	2.0%	135.542	2.3%	407.325	4.0%	147.688	1.6%
40	10.995	2.333	7.2%	9.126	2.5%	0.885		24.746	1.24	67.368	0.7%	140.911	2.0	2.090	
41	11.178			0.378				1.044		2.792	9.7%	4.865	5.5%		
42	11.306	0.307		1.501		0.092		3.980	3.4	10.906	3.5%	21.295	2.7%	0.552	
43	11.440	1.768		7.456	4.51	0.336		19.889	3.31	57.248	1.9%	126.191	2.2%	4.873	5.7%
44	11.564	3.282		11.321	5.0%	0.438		30.415	4.4%	89.914	4.8%	255.552	4.3	25.603	5.21
45	11.670	0.998		6.669	6.91	0.237		18.879	6.0%	55.858	6.3%	77.982	6.3	0.200	1 0*
46	11.741						•							72.371	1.9%

Notes:

Retention times linearly adjusted to place tetrachloro-meta-xylene at 5.3603 and decachlorobiphenyl at 17.3117.
 Peaks chosen within window of +/- 0.01256 of the mean RT of corresponding peaks in all mixtures.
 Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT^ 1.05286.

AIUCIUI Callulation Summary

Calibration of 27-Nov-2000 11:09 through 28-Nov-2000 00:38.

MCD1: [8080] 01,02 27NOV000957

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

						•		ì							
Peak #	RT	Aroclor	1221	Aroclor	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
47	11.796	7.282	6.4%	21.478	3.2%	1.048		55.548	3.91	165.634	3.6	519.663	2.2%	88.223	3.9%
48	12.053	6.166	93.	11.258	56.	3.496		20.071		53.167	7.48	106.798	4.7%	198.573	2.1
49	12.148	1.863		2.078				3.673		9.896		65.047	4.21	112.743	1.8%
50	12.230	0.774		1.485				3.804	29.	10.254	10.1%	31.008	5.41		
51	12.294													445.516	3.3%
52	12.330	5.135	19.	13.588	7.6%	1.216		37.905	2.7%	104.452	4.7%	387.691	4.6		
53	12.507	0.249										30.557	2.21	28.649	4.31
54	12.627	0.440		0.478				1.199		3.668		44.319	3.1%	72.860	3.2%
55	12.734	2.804		2.820				4.968	5.91	12.977	4.48	234.931	2.1%	526.938	2.3%
56	12.798	3.900						1.700						207.344	7.91
57	12.820	3.515		10.710	7.1%	0.791		29.120	4.75	86.249	8.2%	279.182	7.1%		
58	12.951	0.936		1.208				2.139	• • • •	6.082	6.4	80.176	5.84	214.313	7.0%
59	12.988							, 2.200		0.002	0	00.1.0	3.50	144.642	1.11
60	13.068	0.887						2.009		3.241		34.873	4.3%	2171012	
61	13.108	0.701		0.775				1.190		2.902		40.072	3.3%	58.113	4.2
62	13.196	3.963		3.907	3.0%			10.469	3.3%	25.801	4.3%	465.042	2.3%	598.208	2.61
63	13.323	0.345		0.452				1.035	3.30	2.960	8.6%	40.983	5.14	75.855	3.51
64	13.443	0.567		1.089				0.263		1.747	0.00	19.169	4.3%	346.556	1.4%
65	13.518	0.229		0.512				0.183		0.841		14.398	4.0%	193.227	3.1%
66	13.614	0.914		0.774				3.674		8.228	4.9%	136.823	6.31	51.389	7.5%
67	13.676							1						53.286	5.21
68	13.782	0.561		1.139				0.260		1.737		25.132	3.2%	364.143	0.9%
69	13.860			0.409						0.656		15.184	9.0%	199.170	1.21
70	13.929	0.553		0.540				2.034		3.230		62.634	9.8%	134.568	5.0%
71	14.014									0.537		14.407	17.	31.590	8.7%
72	14.066											7.426		59.802	6.8%
73	14.160			3.434						4.390		51.179	3.0%	747.093	1.7%
74	14.361					0.553		1		0.751		1.048		24.790	2.0%
75	14.621			1.280				0.759		2.235		39.360	5.9%	331.328	4.8
76	14.746			0.975				:		1.563		2.232		162.414	1.0%
77	14.837									1.938		3.019		182.773	1.5%
78	15.376											1.016		68.962	4.1%
79	15.491	0.551		0.616		0.714		0.599		0.808		0.798		6.142	2.2
80	15.735	0.152		0.362						0.639		1.420	4.8%	146.551	4.5%
81	15.849	2.793												9.705	5.7%
82	16.546	1.901	16.	1.844	6.1%	1.647	14.4%	1.808	2.0%	2.100	4.1%	2.113	2.9%	45.215	2.7%
						******		******					*****	******	
	Total:	751.2	4.4%	1798.8	3.9%	2951.8	3.7%	3085.3	3.9%	3844.8	3.5%	4809.0	4.0%	6382.4	3.0%

Retention Time Marker/Surrogate Standard Summary

Compound	Mean RT	RT Dev. Range	RT Crit.	Mean RF	Recovery Range	Surr Crit
tetrachloro-meta-xylene	5.3603	0136 to .0130	Passes	9730.696	75.1 to 110.0%	** Fails *
decachlorobiphenyl	17.3117	0139 to .0172	Passes	6101.980	93.1 to 115.9%	** Fails *

Notes:

1) Retention times linearly adjusted to place tetrachloro-meta-xylene at 5.3603 and decachlorohiphenyl at 17.3117.
2) Peaks chosen within window of +/- 0.01256 of the mean RT of corresponding peaks in all mixtures.

3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.05286.

Aroclor Calibration Summary
Calibration of 27-Nov-2000 11:09 through 28-Nov-2000 00:38.

MCD1:[8080] 01,02 27NOV000957

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

						•									
Peak #	RT	_Aroclor	1221	Aroclor	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
1	3.528	10.942	9.3%	10.259	8.51	11.727	6.51	10.324	2.51	9.520			14.31	10.470	10.91
2	3.822	4.617	17.	4.215		4.569	29.	4.076	16	3.857		3.628			
3	4.531	207.275	11.6%	121.159.	9.61	8.217	60.	8.911	59	3.500		4.752	19.	4.125	6.8%
4	5.050	60.873	5.1%	33.528	4.5%	0.696	'	0.649	22.	3.500	70.	4.732		4.584	
. 5	5.490	40.559	3.2%	27.622	5.11	13.872		11.515							
6	5.531	69.609	4.4%	57.680	5.9%	47.582	5.54	38.967	4.81	3.082	20.	1.464		0 707	
7	5.754	290.486	2.6%	197.623	3.74	100.917	3.6	85.828	3.3%	26.131	4.9%		0.00	0.787	
8	6.006	191.012	3.2	142.327	4.4	97.485	3.41	79.537	3.61	4.938	9.91	23.560	9.2%	24.541	10.3%
9	6.127	623.892	5.2%	530.311	5.34	486.810	5.34	393.111	5.61	42.819	9.21	0.877		0.632	
10	6.211	85.980	4.1%	55.258	4.4%	23.024	7.4%	19.381	6.2%	1.212	3.28	11.162	3/.	8.621	
11	6.725	6.844	86.	27.224	10.9	66.761	8.2%	52.656			e 04	0.263			
12	6.830	50.062	2.6	27.774	3.5%	8.544	12.3%	7.688		15.200	5.9%	2.596		2.157	
13	6.975	142.980	6.41	419.306	6.6	906.039	B.0%	710.187	27.	0.944					
14	7.203	5.517	5.61	28.133	3.04	67.984	2.18	51.980	8.2%	347.269	6.7%	17.074	27.	11.323	57.
15	7.321		2.0.	0.733	3.04	2.007	2.18		1.9%	14.137	4 3 %	1.016		0.532	
16	7.424	14.198		115.034	4.0%	290.686	0.9%			0.419		1.081			
17	7.551	25.369	3.6	159.824	2.74	384.458		216.845	2.8%	104.287	4.8%				
18	7.595	13.405	3.00	84.697	2.75	208,390	3.3%	295.115	4.0%	107.445	1.8%	5,445		3.404	
19	7.669	9.986	10.1%	39.599	7.0%	93.677	2.8%	156.897	2.7%						
20	7.863	69.336	4.8	559.012	2.8%	1419.708	5.0%	70.599	5.1%	10.839	9.6%	0.736		0.445	
21	8.200	38.594	3.9%	265.769	2.3	650.461	1.7%	1067.880	2.0%	620.060	2.1%			9.463	
22	8.306	30.57.	3.74	33.892	6.0%	98.539	2.6%	496.361	2.8%	231.387	1.91		13.5%	4.515	16.
23	8.412	0.243		11.100	7.7%		2.3%	75.201	2.4%	105.136	2.6%	9.160	9.2%	0.509	
24	8.493	23.708	6.91	181.590		35.340	5.8%	26.137	4.7%	33.994	1.9%	0.623		0.164	
25	B.654	18.930	0.34	171.036	4.0%	469.320	3.8%	349.636	3.6%	167.727	3.83	4.539	8.5%	2.614	11.1%
26	8.714	10.930		55.199	5.2%	456.584	4.9%	361.105	5.91	668.479	5.9%	530.548	6.6%	35,120	12.3
27	8.766	7 096	13.4%	162.549	2 24	159.894	2.0%	122.554	3.0%	167.581					
28	8.831	1.984	13.44		2.7%	448.204	2.8%	345.457	3.7%	541.530	3.8%	139.359	2.7%	3.612	16.
29	8.903	2.331		68.543 68.478	1.8%	197.726	3.14	151.753	1.8%	237.892	1.48	19.544		1.824	
30	9.003	2.331		21.516	2.2%	194.820	2.91	149.014	3.3%	201.924	3.4%	10.931	10.3%	2.196	
31	9.405	19.943	22	239.668	20.	56.122	5.7%	43.914	9.31	58.001	7.7%	4.067			
32	9.504	4.496	22.		3.4%	603.309	2.6%	496.604	3.4%	803.013	3.3%	293.469	4.1%	9.221	
33	9.675	2.077		91.143	2.7%	229.846	1.7%	190.257	3.0%	268.705	2.3	23.449	9.2	3.259	
34	9.741	6.417	2.2	69.276 145.437	2.4*	171.250	2.2%	147.467	1.9%	239.800	1.5%	19.567	9.1%	1.885	
35	9.828	2.029	23.		1.6%	329.377	1.9%	318.168	1.8%	531.162	1.3	96.525	3.3%	4.318	39.
36	9.990	0.422		51.272 8.794	1.7% 3.9%	125.097	2.0	111.732	1.5%	135.589	1.0%	4.447		1.701	
37	10.086	4.852	16	111.580		5.606	3.6%	20.452	5.3%	32.324	5.3%	4.085	14.0	0.188	
38	10.189	4.052	10.	111.580	3.2%	47.905	3.2%	247.316	2.7%	419.576	2.0%	95.522	6.1	2.158	10.9%
39	10.234	12.744	7.3%	208.294	2.31	100.864	2.1	450 050							
40	10.382		14.3	197.841		85.551	2.34	450.859	1.8%	853.915	1.5%	408.804	3.71	5.775	5.8%
41	10.533	15.494	3.5%	38.825	2.6% 2.2%	55.557 41.932	2.6%	427.155	2.41	729.660	2.14	128.748	5.7%	4.008	8.6
42	10.672	2.087	3.54	6.153			1.5%	94.540	2.3%	266.145	2.8%	800.203	4.0%	346.233	1.7%
43	10.750	2.006		16.540	26. 7.5¥	0.846	F 01	18.371		55.531	7.7%	204.882	2.7%	51.760	8.6%
44	10.851	17.671	5.0%				5.0%	41.684	5.8%	94.189	3.3%	137.170	3.2%		
45	11.039	6.283	7.1	40.022 27.598	3.4%	4.954	4.6%	101.597	2.6	284.070	2.6%	1021.436	4.6%	444.940	1.2%
46'	11.096	5.940		178.826	4.5%	34 444		77.828	3.6%	209.649	1.6%	439.812	2.9%	4.859	12.3%
47	11.217	0.120	14.04	1/8.026	4.55	14.464	10.64	390.320	5.21	668.651	5.3%			3.539	,
48	11.371	5.469	6.71	22 101	5.64	7 050				18.855		17.809			
49	11.531	0.977	0.74	23.191		7.051	8.8%	61.370	3.7%	173.968	1.7%	346.578	3.0%	19.012	6.4%
77	41.331	0.777		4.498	12.0%	0.264		12.594	6.4%	36.512	5.1%	73.458	3.9%	1.429	

Notes:

1---

¹⁾ Retention times linearly adjusted to place tetrachloro-meta-xylene at 5.1065 and decachlorobiphenyl at 17.3684.

²⁾ Peaks Chosen within window of +/- 0.01256 of the mean RT of corresponding peaks in all mixtures.

3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.10959.

JLB · HP2620

Calibration of 27-Nov-2000 11:09 through 28-Nov-2000 00:38.

MCD1: [8080] 01,02 27NOV000957

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

						- •									
Peak #	RT	Aroclor 1	221	Aroclor	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
50	11.680		2.6%	26.507	2.0%	1.608		70.318	2.61	198.441	1.61	415.411	2.31	17.329	6.11
51	11.831		8.7%	35.291	6.01	1.461		95.855	5.41	282.890	4.4%	812.468	3.21	88.274	5.91
52	11.961	3.396		23.500	4.34	1.241		66.405	5.34	192.124	4.91	266.981	5.51	1.447	3.34
53	12.066	22.599	5.4	70.710	2.8%	2.908	•	186.608	3.0%	545.880	2.0%	1689.411	2.3%	276.355	4.4%
54	12.111						-	,						632.007	1.3%
55	12.161	2.109		3.170				9.156	18.	29.308	12.4%	188.297	2.2%	284.793	2.30
56	12.252	0.927						1				129.799	3.3%	246.535	3.6%
57	12.396	14.678		43.177	7.7%	3.574		124.738	3.2%	335.760	3.4%	1099.882	4.6	210.555	.,
58	12.435	17.673 3	17.	45.613		2.552		1				862.320	3.4%	1404.212	2.6%
59	12.462			29.996				71.274	6.0%	200.687	0.B%	002.520	3.11	1101.212	2.0.
60	12.565	1.919		1.998				4.045		11.939	7.6%	148.980	2.0%	237.339	3.3%
61	12.688	8.294 1	0.7%	8.507	11.0%			16.317	9.91	45.032	8.3%	744.811	2.2%	1631.712	0.9%
62	12.806		•									40.659	7.48	21.797	106.7%
63	13.002	2.173		2.896				4.727		15.371	7.2%	254.892	6.0%	696.824	6.3%
64	13.081	18.669		33.890	4.2%	2.020		95.317	4.7%	282.847	7.6%		0.00	0,0.02.	0.5.
65	13.106	0.150										707.004	2.4%	567.221	2.7%
66	13.148							i						424.248	1.34
67	13.162							!				173.805	6.1		2.50
68	13.279	3.008		3.527	8.5%			5.563		19.981	15.	384.917	3.9%	957.166	2.9
69	13.340		77.	9.659	7.3%			31.698	7.4%	78.613	7.6%	1397.633	3.3%	1537.651	3.21
70	13.432	1.561		2.882				0.379		5.496		74.173	9.4%	1105.734	1.0%
71	13.519	8.620		9.581		4.391		10.074	81.	17.439	51.	167.559	3.7%	647.269	1.8%
72	13.580							2.012		4.010		69.715	8.0%		
73	13.711	4.756		2.496		2.862		18.940		3.161		10.769	31.	175.342	4.73
. 74	13.907	11.224		11.583	•			18.468		40.870		480.293	4.2	1327.237	0.6%
75 76	14.021	14.720		17.941		17.670		47.860						641.850	0.7%
77	14.041	5.454		5.403				11.420		19.142	41.	224.758	7.2%		
78	14.096					63.830		i		9.031		72.602	26.	341.859	2.6
79	14.163	8.993		13.946				8.063		21.918		200.314	5.7%	2505.483	2.0%
80	14.512							ł				6.400		79.505	9.6%
81	14.637							1						32.194	4.91
82	14.753	1.728		1.692		0.842		1.439		3.823	51.	22.531	7.4%	665.799	2.3%
83	14.830	1.716		3.585		3.291		1.711		6.743	•	121.990	7.2%	1322.675	4.1%
84	15.098 15.347					1.903		1		0.279		3.904	8.3%	25.617	14.48
85	15.547	2.596		2.595	29.	5.685			14.1%	3.826	4.1	3.661	11.8%	37.508	4.4
86	15.628	1.212		1.423		5.887		1.461		1.857		1.811		15.794	6.9%
87	15.628	0.164		0.664				1		1.032		2.370	9.9%	208.770	4.7%
88	16.579	0.410	_	0.925				0.142		2.028		4.317	11.1%	487.255	4.5%
*****	10.3/9	5.569 1	6.	5.778	6.2%	5.386		5.761	9.3%	6.621	8.4%	6.679	6.8%	155.016	3.5%
	Total:	2335.3	****			*****					****	****	****	******	
		4333.3	5.3%	5558.9	4.4%	8970.6	3.9%	9525.9	4.0%	11936.8	3.2%	15716.8	3.8%	19835.7	2.5%

Retention Time Marker/Surrogate Standard Summary

Compound	Mean RT	RT Dev. Range	RT Crit.	Mean RF	Recovery Range	Surr Crit
tetrachloro-meta-xylene	5.1065	.0131 to .0113	Passes	27481.549	77.8 to 113.4%	** Fails *
decachlorobiphenyl	- 17.3684	0106 to .0138	Passes	20342.705	88.5 to 117.8%	** Fails *

Notes:

¹⁾ Retention times linearly adjusted to place tetrachloro-meta-xylene at 5.1065 and decachlorobiphenyl at 17.3684.

²⁾ Peaks chosen within window of +/- 0.01256 of the mean RT of corresponding peaks in all mixtures.

3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.10959.

2620_1127F6

CALIBRATION SUMMARY BACK CALCULATIONS

Lab ID: STL-VT

Calib date(s): 27-NOV-00 11:09

GC: HP2620

27-NOV-00 00:38

Col. 1: RTX-5 Col. 2: RTX-35

File: 1,2 27NOV000957

	50	100	200	400	800	
Standards	ppb	ppb	ppb	ppb	ppb	%RSD
		! :	·	,	·	:
Aroclor 1016	50.0	104.0	208	397	792	
Cal Fact	1.000	1.040	1.040	0.993	0.990	2.5
% Diff	0	-4	-4	1	1	
Aroclor 1221	56.8	100	211	410	772	
Cal Fact	1.136	1.000	1.055	1.025	0.965	6.3
% Diff	-14	0	-6	-3	4	
Aroclor 1232	49.4	100.0	208	409	785	
Cal Fact	0.988	1.000	1.040	1.023	0.981	2.4
% Diff	1	0	-4	-2	2	:
Aroclor 1242	49.1	102.0	209	399	792	
Cal Fact	0.982	1.020	1.045	0.998	0.990	2.5
% Diff	2	-2	-5	0	1	
Aroclor 1248	49.8	102.0	196	404	798	
Cal Fact	0.996	1.020	0.980	1.010	0.998	1.5
% Diff	0	-2	2	-1	0	
Aroclor 1254	51.7	101.0	201	385	811	
Cal Fact	1.034	1.010	1.005	0.963	1.014	2.6
% Diff	-3	-1	-1	4	-1	
Aroclor 1260	47.8	98.4	197	402	805	
	0.956	0.984	0.985	1.005	1.006	2.1
% Diff	4	2	2	-1	-1	

Cal Fact = Calc. Conc. / Nominal Conc.

%RSD = STD Dev / Mean of Cal Fact

% Diff = (Nominal Amt-Calc Amt) / Nominal Amt*100

Kal290f7

AROCLOR CHECK STANDARD SUMMARY

ib ID: STL-VT GC: HP2620 RTX-5 Col. 1:

Initial Calib. 1,2 27NOV000957

date/time: 11/27/00 11:09 to

Col. 2: RTX-35 11/28/00 0:38

Date: 11/28/00

Check Standard File: 1,2 27NOV001748,13

Time: 5:39

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb) :	% Diff.
AR1248	200	200	0.0
7 11 12 10			

Date: 11/28/00

Check Standard File: 1,2 27NOV001748,14

Time: 6:02

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1242	200	208	4.0

Date: 11/28/00

Check Standard File: 1,2 27NOV001748,27

Time: 11:03

Amount (ppb)	0/ 0:11
Amount (ppb)	% Diff.
199	0.5
	199

Date: 11/28/00

Check Standard File: 1,2 27NOV001748,28

Time: 11:26

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1254	200	206	3.0

Date: 11/28/00

Check Standard File: 1,2 27NOV001748,35

Time: 14:09

	Amount (ppb)	% Diff.
200	200	0.0
	Amount (ppb) 200	and the control of th

Kal290f7

AROCLOR CHECK STANDARD SUMMARY

.ab ID:	STL-VT			
GC:	HP2620	Initial	Calib. 1,2 27NC	V000957
Col. 1:	RTX-5	date	e/time: 11/27/00	11:09
Col. 2:	RTX-35		11/28/00	0:38
Check Stand	ard File: 1,2 27NOV00	01748,36	Date: Time:	11/28/00 14:32
		Nominal	Calc.	
1	Compound	Amount (ppb)	Amount (ppb)	% Diff.
	AR1260	200	206	3.0
	ARTZOO	200	200	3.0
Check Standa	ard File: 1,2 28NOV00	01500.8	Date: Time:	11/28/00
		Nominal	Calc.	
	Compound	Amount (ppb)	Amount (ppb)	% Diff.
	AR1248	200	199	0.5
Check Standa	ard File: 1,2 28NOV00	91500,9	Date: Time:	11/28/00
	- <u></u>	Nominal	Calc.	
ļ	Compound	Amount (ppb)	Amount (ppb)	% Diff.
	AR1242	200	206	3.0
ـــــــ Check Standa	ard File:		Date: Time:	·
	Compound	Nominal Amount (ppb)	Calc. Amount (ppb)	% Diff.
			Date:	
Check Standa	ard File:		Time:	
	Compound	Nominal Amount (ppb)	Calc. Amount (ppb)	% Diff.
L				

Aroclor Calibration Summary
Calibration of 27-Nov-2000 11:11 through 28-Nov-2000 00:22.

MCD1: [8080] 49,50 27NOV001002

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

					•	- an noop	J., 100 . 4	- D.O.O a	u 1.0.0.	المرادة المرادة					
Peak #	RT	Aroclor	1221	Aroclor	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
1	3.318	91.834	2.2%	53.047	1.64	1.179		1.239							
2	3.743	22.903	13.5%	13.164	8.9%	2.722		4.263		2.558		3.274		3.134	
3	4.229	110.603	4.4%	77.139	3.7%	30.141	3.4%	27.528	5.4%	3.110		1.458		1.051	
4	4.323						_			10.902	5.1%	10.310	9.48	9.810	12.2%
5	4.351	85.419	2.8%	67.631	2.6%	41.712	3.2%	38.080	4.28	20.702	3.1.	10.510	2.70	9.610	12.26
6	4.420	287. 476	0.9%	249.174	0.9%	195.676	1.9%	174.272	1.48	17.439	3.31	2.713		1.945	
7	4.672	2.075		12.020	3.21	26.463	1.3%	22.096	4.3%	6.142	5.5.			0.516	
8	4.895	17.236	7.4%			·		1		V				0.316	
9	4.944			155.879	2.3	338.887	4.0%	283.453	3.8%	147.010	2.8				
10	5.080	4.730		19.187	2.5%	41.094	2.0%	34.059	4.1%	7.931	12.7%	0.737			
11	5.202	19.984	15.0%	128.894	0.7%	289.254	0.9%	240.526	0.8%	98.896	2.8	6.262	42.	5.003	97.
12	5.315	7.163	9.2%	8.703	14.3%	10.081	9.4%	9.743	10.2%	7.535	8.9%	7.524	9.31	7.518	9.2%
13	5.359					5.858	13.4%	4.858			0.50	7.524	3.34	7.310	9.28
14	5.434	7.241	43.	31.132	9.9%	66.669	2.4%	55.811	12.0%	19.099	19.	3.521	71.	3.089	
15	5.572	28.500	5.4%	255.639	4.13	601.337	1.9%	491.962	2.3%	298.909	2.4%	8.966	6.81	3.843	8.1%
16	5.739	19.285		136.265	2.0%	310.032	1.34	254.730	1.2%	128.818	2	7.016	0.01	3.043	0.14
17	5.859	8.932	7.5%	78.460	7.0%	188.296	5.2%	152.209	5.71	75.709	5.0%	2.144	22.	1.210	
. 18	5.951	0.741		23.954	4.9%	65.598	2.0%	52.591	2.01	66.181	1.84	1.710	22.	0.351	
19	6.120	7.264	18.	77.581	0.7%	195.179	4.0%	164.296	2.8%	312.942	3.4%	240.929	2.7%	13.433	3.0%
20	6.194	5.920	38.	75.798	4.3%	189.843	3.6%	157.371	4.31	249.399	3.7%	68.892	4.61	4.384	88.
21	6.255			50.056	1.0%	129.980	3.0%	106.931	2.8	157.058	3.5%	00.072	4.01	4.304	88.
22	6.493	5.098	6.0%	98.108	2.5	246.538	1.3%	209.166	1.01	375.271	0.8	137.359	1.7%	2.409	
23	6.552	3.877	17.	63.247	3.74	130.449	1.5%	128.453	1.31	156.357	0.9%	137.339	1.71	1.014	
24	6.715	3.807	9.2%	97.073	3.2%	215.811	1.7%	212.059	1.8%	346.983	1.3%	49.172	3.41	2.047	15.
25	6.884	0.821		25.480	7.1%	44.763	5.0%	54.070	3.7%	86.800	2.6	8.195	8.43	0.391	15.
26	7.059	0.121		3.349	14.9%	1.807	• • • •	7.871	9.4%	13.605	9.3%	1.627	0.4*	0.351	
27	7.133	1.659		44.855	6.01	17.524	6.31	100.339	3.4%	175.559	3.11	39.773	5.1%	0.712	
28	7.212	4.637	8.71	85.205	3.74	28.507	4.5%	185.534	1.78	359.190	1.1%	172.799	2.21	2.026	
29	7.287			84.611	4.11			181.105	1.8%	324.800	1.2%	1,2.,,,	2.2	2.026	
30	7.311	8.249	6.51	· · · ·		27.446	2.9%	101.103	2.00	324.000	1.2.	409.804	2.5%	166.260	3 44
31	7.443	0.988		6.338	7.7%	3.846	8.4%	16.229	3.6%	43.804	1.6%	65.869	1.81		1.4%
32	7.644	4.059	11.3%	80.902	6.31	6.455	7.18	178.809	5.2%	319.285	5.5%	124.734	1.8%	0.787	2 24
33	7.761	10.464	6.1%	30.479	3.6%	5.346	8.0%	76.102	1.34	210.330	2.3%	623.319	2.8%	25.671	2.9%
34	7.871	2.771		12.522	7.18	0.982	0.04	35.040	3.3%	94.949	1.5%	199.859		207.937	2.5%
35	8.011	0.208		0.430		0.702		1,490	3.34	4.136		7.236	1.7%	2.941	
36	B.131	0.566		2.104		0.180		5.571	6.8		12.7%		5.4%		
37	8.245	2.450		10.709	5.1%	0.520				15.622	3.2%	31.460	1.7%	0.717	
38	8.363	4.680	10.7%	17.307	5.6%			27.951	2.7%	79.603	0.9%	174.744	1.1%	6.592	4.1
39	8.459	1.377	10.74			0.695		45.227	3.1%	128.837	2.2%	360.086	2.7%	35.647	2.9%
40	8.545	1.3//		9.654	10.1%	0.284		26.421	5.9%	75.210	2.3	106.135	2.1		
41	8.590	8.926	E 01	20 522	4 00			1						92.150	2.4
42	8.866	1.716	5.0%	29.528	4.9%	0.868		75.352	3.3%	217.902	1.4%	696.759	1.4%	117.139	1.2%
43	8.971			8.748	8.61	0.192		21.033	6.0%	62.456	3.41	128.982		235.017	1.7%
44		0.961		1.402				3.219	11.1%	9.777	9.5%	84.132	1.8%	143.344	1.1%
45	9.063 9.151	0.306		1.153				3.723	11.24	10.921	10.5%	37.866	4.6		
73	3.131	9.518				3.622		•						541.210	3.51

Notes:

OTT Dealings

¹⁾ Retention times linearly adjusted to place tetrachloro-meta-xylene at 3.9707 and decachlorobiphenyl at 14.3552.

²⁾ Peaks chosen within window of +/- 0.01184 of the mean RT of corresponding peaks in all mixtures.

3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.14239.

NIATU

JLB - HP2865

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

								i							
Peak #	RT	Aroclo	1221	Aroclos	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
46	9.178	5.833		16.005	3.8%	0.571		44.141	2.3%	119.972	1.4%	470.762	0.9%		
47	9.421	0.434						İ				37.063	3.5%	35.456	2.8%
4.8	9.460			0.811				2.573	11.3%	7.603	10.9%				
49	9.529			0.449			1	1.409		4.256	11.1%	15.508			
50	9.577	0.452		0.502				1.124		3.436		50.695	2.4	84.092	1.5%
51	9.724	2.948	9.7%	3.100	11.1%			5.475	7.5%	14.280	5.2	259.817	1.9%	578.683	3.2%
52	9.855	6.655		17.016	40.			44.334	24.	118.672	14.7%	370.273	5.41	223.667	
53	10.063	0.677		1.135				1.715		5.647	7.4%	87.746	2.91	234.108	2.6%
54	10.126			0.639								•		135.284	3.91
55	10.242	0.243		0.378				0.972		2.508		38.096	4.6	1.744	
56	10.317							0.976		2.737		41.049	2.91	64.048	2.1%
57	10.456	4.739	12.1%	4.522	7.7%			11.633	8.21	28.640	1.8%	497.633	1.14	630.470	0.78
58	10.676	0.415		0.656				1.168	-	3.273	4.8	41.854	4.1%	78.515	1.4%
59	10.810													15.250	5.11
60	10.890	0.644		1.454						1.732		18.708	3.2%	371.792	2.9
61	11.022	0.234		0.551				0.145		0.808		15.706	5.6%	196.502	1.2%
62	11.202	0.931		0.801				4.024	7.7%	9.048	5.7%	151.586	3.0%	55.998	2.71
63	11.304			0.136								3.544		60.205	3.1%
64	11.500	0.487		1.250				0.264		1.863		30.805	3.94	445.611	0.6%
65	11.622	0.256		0.644				0.127		1.004		19,154	4.7%	243.463	1.7%
66	11.726	0.360		0.600				2.019		4.161	9.91	83.910	5.0%	156.297	1.6%
67	11.850	0.532		0.215				0.696		1.053		17.470	6.7	38.773	2.1
68	11.933			0.164						0.315		7.240	5.6	78.339	2.4
69 70	12.058	1.064		3.081	3.84			0.951		5.192	4.0%	69.413	2.1%	1053.237	1.1%
70 71	12.182 12.299	•								0.137		2.315	5.7%	20.797	4.6%
72	12.299							1						32.730	2.7%
73	12.717	0.489		1.561				0.787		3.283	7.4%	71.197	4.2	608.564	2.4%
74	12.717	0.289		0.551						1.052		2.671		252.594	1.2
75		0.240		0.580						1.142		2.773		285.865	1.1%
76	13.016 13.244							1				2.546	4.14	15.240	5.31
77	13.244											1.973		132.407	2.0%
78	13.321	0.403		0.465				0.428		0.508		0.526		9.860	5.6
79	13.498			0.653				!		1.188		2.972		313.864	1.4%
80	13.563	5 260										<u>.</u> •		20.102	3.4
*****	23.701	5.269	14.41	5.055	11.7%	4.996		5.680	30.	5.975	14.8%	5.068		111.584	1.1%
	Total:	838.2	3.41	2200 0	7 44	2421 4	*****	****		*****	****	*****	*****	*******	
	-00011	030.2	3.44	2289.9	3.4%	3471.4	2.5	4001.4	2.8%	5070.5	2.7%	6245.4	2.5	8224.4	1.9%

Retention Time Marker/Surrogate Standard Summary

Compound	Mean RT	RT Dev. Range	RT Crit.	Mean RF	Recovery Range	Surr Crit
tetrachloro-meta-xylene	3.9707	0107 to .0093	Passes	13497.137	73.6 to 107.9%	** Fails *
decachlorobiphenyl	14.3552	0108 to .0070	Passes	16370.487	95.5 to 112.7%	Passes

Notes:

¹⁾ Retention times linearly adjusted to place tetrachloro-meta-xylene at 3.9707 and decachlorobiphenyl at 14.3552.

²⁾ Peaks chosen within window of +/- 0.01184 of the mean RT of corresponding peaks in all mixtures. 1) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE - HEIGHT 1.14239.

MCD1: [8080] 49,50 27NOV001002

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

							•		1							
<u>Pea)</u>	<u>k_#</u>	RT	_Aroclor		Aroclor		Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
	Ţ	3.274	4.702	10.6%	4.913	10.4%	4.582	9.6	4.520	6.7%	4.401	4.6%	4.536	6.78	4.440	5.91
	2	4.226	134.719	4.8%	77.943	2.4	4.246		5.338	40.	2.352		3.519	• • • • • • • • • • • • • • • • • • • •	3.067	3.74
	3	5.128	39.851	2.2%	34.037	3.5%	24.244	1.78	21.949	3.2%	1.791		3.323		3.007	
	4	5.313	159.023	3.1%	114.783	3.5%	51.852	2.6%	49.473	4.0%	15.552	6.1%	13.887	5.91	13.789	4.9%
	5	5.551	108.913	1.5%	85.211	1.5%	51.095	1.5%	46.229	2.0%	2.964	0.1.	0.354	3.34	0.320	4.94
	6	5.660	352.290	0.B%	310.179	0.9%	254.300	2.2%	223.859	1.9%	22.607	5.61	3.458	20	2.876	
	7	5.738	50.689	3.4%	34.654	3.1%	13.562		12.639			3.0.	3.430	20.	2.070	JO.
	В	6.296	18.654	5.4%	10.850	4.1*	3.253		3.417							
	9	6.430	59.627	5.2%	239.495	3.7%	501.694	4.9%	416.877	4.6%	202.372	5.0%	9.073	21	6.051	63
	10	6.640	2.830		16.497	7.1%	36.561	3.5%	30.692	3.0%	7.802	7.0%	0.381	21.	0.188	61.
	11	6.840	8.328		67.446	4.61	156.902	1.5%	128.663	1.4%	60.997	3.3%	0.301		0.188	
	12	6.965	14.791		98.000	0.9%	217.855	1.7%	179.286	2.1%	65.003	0.7%	3.339		1.843	
	13	7.058	4.938	9.6%	20.689	6.61	44.009	3.8%	36.455	3.4%	5.813	0.71	0.386		0.207	
	14	7.232	34.014	1.7%	284.962	2.41	664.779	1.4%	541.857	1.71	329.736	0.7%	10.746			
	15	7.553	18.616	4.48	136.472	1.61	309.932	0.71	253.987	0.6%	119.025	1.15	3.911	9.21	4.818	
	16	7.654			16.900	7.3%	45.451	2.4%	36.506	3.14	52.410	2.4	4.437	12.7%	2.157	
	17	7.751	0.146		5.677	11.8%	16.644	5.9%	12.897	7.5%	17.285	5.5%	0.314	12.74	0.222	
	18	7.825	11.664	6.8%	94.819	5.41	224.168	4.48	180,874	4.0%	88.248	4.28	2.406	7.8%	1.322	
	19	7.970	6.874		80.058	1.3%	203.305	3.2%	169.545	2.91	326.135	4.0%	261.377	2.3	14.402	
	20	8.071	4.442		87.181	1.0%	223.100	2.7%	183.346	2.7%	286.849	3.0%	69.903	0.91	2.249	
	21	8.127	2.565		35.810	2.4%	94.537	1.34	77.017	1.45	123.269	0.6%	63.303	0.54	0.927	
	22	8.200	1.265		34.404	2.5%	92.412	1.21	74.716	1.4%	103.248	1.4%	4.555	3.8%	0.685	
	23	8.308	0.261		8.879	7.8%	24.606	4.8%	19.631	5.01	27.091	3.7%	0.729	3.00	0.160	
	2.4	8.677	8.887	12.1	122.379	1.8%	286.818	0.8%	253.996	1.24	417.532	1.0%	151.508	0.9%	3.851	
	25	8.766	1.980		44.499	2.4	108.047	1.2%	92.874	1.94	138.849	0.8%	10.982	7.78	1.265	
	26	8.926	1.125		36.097	5.5%	83.484	2.0%	77.226	3.3%	129.470	0.7%	9.558	, . , .	0.599	
	27	8.986	2.668	18.	74.211	4.4%	157.868	2.3%	163.459	2.9%	281.832	1.7%	48.882	5.4%	1.231	
	28	9.073	0.743		26.308	7.3%	60.723	3.5%	58.024	4.9%	72.312	1.8%			0.398	
	29	9.210			4.346	14.2%	2.056	11.9%	10.300	14.18	17.504	1.9%	1.895		0.550	
	30	9.301	2.022		50.916	4.0%	19.238	4.61	112.294	2.4%	194.805	0.9%	44.205	3.8%	1.012	
	31	9.426					61.007	3.2%		_					2.412	
	32	9.445	5.831	4.21	105.557	2.4%			227.368	1.1%	433.736	0.3%	199.218	2.0%	2.874	14.1%
	33	9.585	4.057	33.	91.072	3.0%	22.722	2.21	193.072	1.5%	339.080	0.8%	60.226	1.5%	1.960	29.
	34	9.735	6.717	5.7%	17.266	6.3%	17.436	4.3%	42.539	4.1%	126.019	2.0%	397.191	1.8%	170.017	1.84
	35	9.857	1.390		3.398		0.367		9.413	11.2%	28.428	1.3%	102.440	2.3%	25.293	4.0%
	36	9.939	1.070		8.333	9.3	4.019	8.1%	21.175	6.4	47.034	1.3%	67.557	3.0%		
	37	10.028	7.760	7.2%	18.423	6.1%	1.945		47.534	3.2%	134.300	2.1%	497.188	2.2	213.564	1.9%
	38	10.203	3.001	8.2%	12.934	3.7%	1.179		36.505	2.5%	99.806	1.34	209.777	1.2%	2.216	
	39	10.268	3.140	4.5%	91.882	4.8	6.847	11.8%	200.323	4.4%	345.408	4.5%	-42	2	1.756	
	40	10.374							1		6.836		7.741	9.7%		
	41	10.557		11.5%	10.462	8.0%	3.013	10.6%	28.202	4.2	80.955	2.21	165.598	1.2%	8.376	3.6%
	42	10.722	0.496		2.091	1.6%	0.172		5.709	3.8%	16.226	5.11	33.719	4.8%	0.649	3.0.
	43		2.885		11.848	4.18	0.710		30.890	2.9%	88.848	1.7%	189.535	0.9%	7.033	4.51
	44	11.087	5.232		16.119	2.9	1.282		41.255	2.6	120.919	2.5%	363.158	3.4%	38.903	1.4%
	45	11.244	1.372		10.205	9.1%	0.488		28.649	4.78	83.037	3.7%	116.448	4.1%	0.550	
•	46	11.372	9. 993	6.91	30.498	5.6%	1.014		80.589	2.3%	245.866	1.9%	821.895	1.8%	2.250	

Notes:

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Retention times linearly adjusted to place tetrachloro-meta-xylene at 4.7225 and decachlorobiphenyl at 16.4242.
 Peaks chosen within window of +/- 0.01184 of the mean RT of corresponding peaks in all mixtures.
 Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE - HEIGHT 1.12889.

JLB HP2865

Calibration of 27-Nov-2000 11:11 through 28-Nov-2000 00:22. MCD1: [8080] 49,50 27NOV001002

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

								1							
Peak #	RT	Aroclo	1221	Aroclo	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
47	11.421					0.827		111100101					 	278.775	1.64
48	11.489	0.705		1.049				3.336	17.	10.565	14.0%	75.586	1.2%	110.016	1.9%
49	11.596	0.539						1				58,235	0.9%	113.416	2.3%
50	11.636			1.413			•	5.095	9.7%	14.480	10.3%	301233	0.50	113.110	2.3.
51	11.757	4.849	13.8%	18.408	6.0%	0.379		55.981	2.61	153.637	1.9%	514.251	0.7%		
52	11.813	4.430										322.364	2.71	676.070	3.4%
. 53	11.845			11.372	4.78	0.351		28.414	3.4%	84.131	2.5%	322.304	2.,•	070.070	3.44
54	11.959	0.656		0.508				1.368	5.11	4.618	15.	66.963	0.81	114.976	3.1%
55	12.097	3.951	8.3%	4.353	9.9%			8.647	5.8%	23.663	7.4%	350.163	2.21	788.353	3.6
56	12.216			0.715				1.818	2.00	5.719	12.01	330.103	2.2	700.333	3.01
57	12.233	0.299						4.375		52		18.447	3.2%	8.188	23.
58	12.452	1.227		1.660				2.619		7.736	4.78	125.133	3.61	350.928	4.31
59	12.533	11.614		24.375				64.757		174.767	19.	346.350	14.7%	330.320	1.31
60	12.573							011/5/		1,1,10,		293.757	1.5%	291.350	1.7%
61	12.613					0.332						273.737	1.54	208.538	1.48
62	12.755	1.532		1.887	14.9%	*****		3.102		9.500	8.1%	196.783	3.1%	496.877	1.48
63	12.823	5.759	6.3%	5.288	6.5%	0.215		16.504	4.9%	38.811	4.21	719.275	2.1%	797.896	1.41
64	12.923	0.700		1.650				0.368		2.336	12.2%	28,251	6.2%	549.662	2.61
65	13.018			1.740				0.500		6.273	12.20	80.831	2.3%	315.852	0.9%
66	13.080							1.404		2.245		39.202	1.8%	28.007	0.5.
67	13.221	0.125		0.259						0.324		3.177	8.8%	91.504	4.61
68	13.433	9.665	98.	10.680	77.	8.966		14.122	64.	24.539	42.	271.748	2.5%	721.762	1.91
69	13.558	1.448	66.	2.107	35.	0.538		3.984	12.41	8.413	10.8	136.039	3.5%	392.228	1.0%
70	13.618	0.989		1.147	61.	0.684		0.853		1.599	40.	22.692	5.5%	167.577	2.11
71	13.682	1.323		4.070	10.94			1.577	• • •	8.043	8.91	114.802	4.48	1530.736	1.2%
72	13.765			0.136								3.469	14.0%	34.167	7.0%
73	13.991	0.281		0.250		0.386		0.191		0.386		0.695		36.946	3.5%
74	14.099													20.469	2.41
75	14.201	0.395		1.963				0.899		2.374		16.156	4.6%	445.429	1.0%
76	14.272	0.568		2.169				0.987		4.154	11.5%	74.303	4.8%	824.773	2.3%
77	14.500									0.155		3.990	9.3%	22.077	7.6%
78	14.707	1.879		1.848	25.	1.624		2.687	80.	4.341	67.	5.880		25.177	4.21
79	14.884	0.616		0.603		0.490		0.586		1.873		0.623		9.901	7.1%
80	14.959	0.124		0.303						1,104		1.442		138.849	3.0%
81	15.097	0.225		0.736						1.470		3.137	9.3%	363.256	0.8%
82	15.763	4.645	9.7%	4.743	9.91	4.349	8.9%	4.597	9.7%	5.264	8.6%	5.163	8.9%	122.609	2.51
				******						******	***	*****	*****	******	*====
	Total:	1170.5	2.9%	2794.1	3.0%	4122.7	2.5	4699.4	2.6%	5916.3	2.1%	7794.9	2.8	10617.6	2.1%

Retention Time Marker/Surrogate Standard Summary

Compound	Mean RT	RT Dev. Range	RT Crit.	Mean RF	Recovery Range	Surr Crit
tetrachloro-meta-xylene	4.7225	0159 to .0108	Passes	17704.605	76.4 to 107.1%	** Fails *
decachlorobiphenyl	16.4242	0175 to0114	Passes	17025.305	95.8 to 116.8%	** Fails *

Notes:

- 1) Retention times linearly adjusted to place tetrachloro-meta xylene at 4.7225 and decachlorobiphenyl at 16.4242.
 2) Peaks chosen within window of */- 0.01184 of the mean RT of corresponding peaks in all mixtures.
- 3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.12889.

2865_1127F6

CALIBRATION SUMMARY BACK CALCULATIONS

Lab ID: STL-VT

Col. 2: RTX-35

GC: HP-2865

Calib date(s): 27-NOV-00 11:11

to

28-NOV-00 00:22

Col. 1:

RTX-5

49,50 27NOV001002

	50	100	200	400	800	
Standards	ppb	ppb	ppb	ppb	ppb	: %RSD
		: •				<u> </u>
Aroclor 1016	49.3	101.0	201	403	796	
Cal Fact	0.986	1.010	1.005	1.008	0.995	1.0
% Diff	11	-1	-1	-1	1	
Aroclor 1221	49.5	101	200	398	802	
Cal Fact	0.990	1.010	1.000	0.995	1.003	0.8
% Diff	1	-1	0	1	0	
Aroclor 1232	48.0	99.2	197	400	807	
Cal Fact	0.960	0.992	0.985	1.000	1.009	1.9
% Diff	4	1	_ 2	0	-1	
Aroclor 1242	49.3	98.7	203	398	802	
Cal Fact	0.986	0.987	1.015	0.995	1.003	1.2
% Diff	1	1	-2	1	0	
Aroclor 1248	49.3	100	200	400	800	_
Cal Fact	0.986	1.000	1.000	1.000	1.000	0.6
% Diff	1	0	0	0	0	
Aroclor 1254	49.7	101	201	398	801	
Cal Fact	0.994	1.010	1.005	0.995	1.001	0.7
% Diff	1	-1	-1	1	0	
Aroclor 1260	50.0	99.6	203	397	800	•
Cal Fact	1.000	0.996	1.015	0.993	1.000	0.9
% Diff	0	0	-2	1	0	

Cal Fact = Calc. Conc. / Nominal Conc.

%RSD = STD Dev / Mean of Cal Fact

% Diff = (Nominal Amt-Calc Amt) / Nominal Amt*100

KAL290AF7

AROCLOR CHECK STANDARD SUMMARY

b ID: STL-VT GC: HP2865 Col. 1: ____ RTX-5 **RTX-35** Col. 2:

Initial Calib. 49,50 27NOV001002

date/time: 11/27/00 11:11

11/28/00 0:22

Date: 12/4/00

Check Standard File: 49,50 04DEC000810,3

Check Standard File: 49,50 04DEC000810,4

8:56 Time:

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1248	200	184	8.0

Date: 12/4/00

Time: 9:19

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff
AR1242	200	187	6.5

Date: 12/4/00

Check Standard File: 49,50 04DEC000810,10

Time: 11:34

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1248	200	194	3.0

Date: 12/4/00

Check Standard File: 49,50 04DEC000810,11

Time: 11:56

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1254	200	198	1.0

Date: 12/4/00

Check Standard File: 49,50 04DEC001425,5

Time: 15:56

		Nominal	Calc.	
C	ompound	Amount (ppb)	Amount (ppb)	% Diff.
Α	R1248	200	197	1.5

KAL290AF7

AROCLOR CHECK STANDARD SUMMARY

nb ID:	STL-VT			
GC:	HP2865	Initial	Calib. 49,50 271	NOV001002
Col. 1:	RTX-5	date	e/time: 11/27/00	11:11 to
Col. 2:	RTX-35		11/28/00	0:22
	. 5"		Date:	12/4/00
Check Standa	ard File: 49,50 04DEC	001425,6	Time:	16:18
		Nominal	Calc.	
	Compound	Amount (ppb)	Amount (ppb)	% Diff.
	AR1260	200	207	3.5
			i	
Check Standa	ard File:		Date: Time:	
		Nominal	Calc.	
	Compound	Amount (ppb)	Amount (ppb)	% Diff.
 _neck Standa	ard File:		Date: Time:	
		Nominal	Calc.	
	Compound	Amount (ppb)	Amount (ppb)	% Diff.
<u>L</u>			Date:	
Check Standa	ard File:	<u> </u>	Time:	
		Nominal	Calc.	
	Compound	Amount (ppb)	Amount (ppb)	% Diff.
L	· · · · · · · · · · · · · · · · · · ·		Date:	
Check Standa	ard File:		Time:	
<u> </u>		Nominal	Calc.	
L	Compound	Amount (ppb)		% Diff.
				-



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PACE 10/1

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SAMPLER	S: (Signe	otures)		M		Rome	D.Kin)				x / /					
STA. NO.	DATE	TIME	COMP.	GRAB		STATI	ON LOCATION			9/			/		REMARKS	
AMW-4B	באראוו	0320		X	W	7409	9	2	2			- /	411 Stry	DIESL	URSERVED CYC	
MW-9A	סיו/נוע	0230		X	W	2409	B	2	2			- 1	PIEKSÉ P	WHZ	EAS ARKASSO	SAAS
AMW-7A	בפ/בולנו	1325		X		24/10		2	2				PIERSE	Sors	ANALYTHAN ROSLI	<i>√</i> / / / / / / / / / / / / / / / / / / /
A4W-28	111.	1		X	W	74/0		$ \frac{1}{2}$	2				Bulla	(une)	DAVE CAY %	884
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Relinquis	Aul	Signatur		1	DATE	TIME /700	Received by: (Signatur	re)	Relinquish	ed by: (S	Signature)		DATE	TIME	Relinquished by: (Signat	ure)
Relinquisi	red by: (Signature)		DATE	TIME	Received by: (Signatur	re)	Relinquish	ed by: (S	Signatura)		DATE	TIME	Relinquished by: (Signat	ure)
Relinquisi	red by: (Signature)		DATE	TIME	Received for Laborato (Signature)	ry by:	DATE			ME	Remark			
							Jack-LDIS	ti	1/18/00)	1030)	Jes-X	AKA,	11#:82375	45922



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

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CHAIN OF CUSTODY RECORD

PROLING C D D D Z D D D SAMPLER	PROJE KAS S: (Signa	ture)	IE PILLO CAL	w.f	YUS/A:	Sin	E Glim	NUMER MXP6				J. J. J. J. J. J. J. J. J. J. J. J. J. J								
STA. NO.	DATE	TIME	COMP.	GRAB		BTATI	ON LOCATIO	ON .			XX			//	/		REM	ARKS		į.
Ann 88	illislad	1120		X	WT	411	23		6	2	2			-/	411.5A1	NIES,	De	CANBRE	e 44	
AMW-8A	11/18/20	1132		X	W7	4/6)2		C	M I.	2			+]	EKEA	ixtyz	FAS	AERK	CSG GAL	∞
							1 10 · · · · · · · · · · · · · · · · · ·		7 %					F	EASE S	EUS	Av	441714	1 RS45	70
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10/23/95

Distribution: Original Accompanic

Alpment; Copy to Coordinator Field Files



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROL NO GAS-AS-AS SAMPLER	PROJI KASA 8: (Signa	ECT NAN	E //	S110,	/A-S. #	642	were D. Kin)		/	Section	DIAL DIAL				,	
STA. NO.	DATE	TIME	COMP.	GRAB			ON LOCATION		A SECOND		Mark Mark					REMARKS
AMW-2	11/5/00	0910		X	WZY	1088		i	2	2			-1	rll Samo	nes D	Isaape 4°C
ww-2		l.		K	w74	089			2	2			- 4	Perse An	4H2E	15 DER KKG OAN
AMW-108	11/15/00	1100		K	WY			1	6	27			- ,	Proce Se	<u>us Au</u>	MYTHUN ASUS TO
Mr. ww.M	ulsho	1610		x	WY	090			2	2				BILMU	ine/	Mythan Assus To Dave / My 9/0 BBL
	ulidos	1645		K	WTY	29/		1	2	2						
WMW-41	Illula	1000		X	W74	193		18.30	2	2				6723	DWP	try Road
WMW.4B	1/14/00	1000		X	W741	294)	2				5-KAC	15R . N	D.J. 13214 PREW AROMS
ww-3	1 4	ł		X	WYY	195		C	\mathcal{Z}	2				STANK	DRY-	TRAN AROUND
WHO 3AR	'1'	i		X	WYO	96		. (24						
	1/16/10	1400		K	W740	197		ć	₹	2						

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Relinquisi	ed by: (Signature)		DATE	TIME	Received for Laboratory by: (Signature)	1		DATE	- 1		VE Z.C	Remark		11#: 823750545744
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10/23/95

Distribution: Original Accompar.

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Lab Name: Severn Trent Laboratories - VI		IES LUG-IN	SALEI - FOFF	Page of 1
Received By (Print Name):SCO	H Lau	918		Log-in Date: 11/20/00
0		/		
Received By (Signature):		C	ORRESPONDE	NG
Case Number: 2000	ļ			
Sample Delivery				REMARKS: CONDITION
Group No: KAL290	CLIENT	SAMPLE	ASSIGNED	OF SAMPLE SHIPMENT,
ETR Number: 80689	SAMPLE#	TAG#	LAB#	ETC.
REMARKS:	W74088	NIA	438383	Were air bubbles present
1. Custody Seal Present Absent*	W74089		1	in any VOA vials? NA
Antact Broken	W74092		438385	Samples received
2. Custody Seal Nos.: NIA	W7409 D		438386	Intact, AS were
3. Chain-of-Custody	W7409]		438387	Custody Seals an
Records Present ibsent*	W74013		438388	outside of cures
4. Sample Information	W74094		438589	
Sheets Present Absent	W74095		438390	
5. Airbill <u>Airbill Sticker</u>	W74096		438391	
Plesend Absonit	W14097		438392	
6. Airbill No.: 823 7505 459 44				
7. Sample Tags Present forces				
Sample Tag				
Numbers Listed Not Listed				
on Chain-of-Custody				
8. Sample				
Condition: Intact Broken*	. 1			
Leaking				
9. Does information on the custody				
records, sample information sheets,				
sample tags and labels agree?				
705 Vo.*				
10. Date Received at Lab: 11 100 00				
11. Time Received: 0930				
12. Cooler Temperature: 3°3°				
Sample Transfer				
Fraction: A //				
Area #:				
By: 5ml				
On: 11/17/00		SM	11/2010)
* Contact Project Director				
Reviewed by:			Logbook No.: _	
Date:			Logbook Page N	lo.:

SEVERN TRENT	r Laborator	LES LOC-IN	SHEET - Fort	n DC-1		
Lab Name: Severn Trent Laboratories - VI	<u> </u>			Page	of	
Received By (Print Name):	Dusti	Δ		Log-in Da	te: 11/c	2160
Received By (Signature):	LDO	ti	-			
		C	ORRESPONDI	NG		
Case Number:			<u> </u>	T		
Sample Delivery		G + 1 (D) =	A GGT GV TOP	REMARKS		
Group No: KAL 290	CLIENT	SAMPLE	ASSIGNED	OF SAMPL	E SHIPM	ENT,
ETR Number: 80710	SAMPLE #	TAG#	LAB#		ETC.	
REMARKS:	W74099	NA	438495	Were air bubb		
1. Custody Seal Present Absent	W74098		438496	in any VOA v	ials? N	4
(Inlate) Broken	W74 100	-\ /-	438497	Sample	5 T	eceive
2. Custody Seal Nos.:	W74101		438448	tact	- 22	COOP1
3. Chain-of-Custody				MITP	cer	Cooler
Records Presentitions				W CCC,	VCC:	<u> </u>
4. Sample Information				as we	re co	ustuck
Sheets Present Asen)*				Seals,		
5. Airbill Airbilt Sticker						
Present Absent *						
6. Airbill No.: 823750545926						
7. Sample Tags Present Absent						
Sample Tag					_/	•
Numbers Listed Not Listed						
on Chain-of-Custody	4					
8. Sample						
Condition: (Intac) Broken*					VD	
Leaking	·					
9. Does information on the custody					11/	21/0
records, sample information sheets,					,	
sample tags and labels agree?						
Yes No+						7
10. Date Received at Lab: 11/18/00						
11. Time Received: 1030						
12. Cooler Temperature: 20						
Sample Transfer						
Fraction: All						
Area #: Lui 4 Frig						
By: Jack Date						
On: 1/18/00 1030						
* Contact Project Director						
Reviewed by:			Logbook No.: _			_
Date:	·		Logbook Page N	lo.:		_

SEVERN TREM	r Laborator	UES LOC-IN	SHEET - For	1
Lab Name: Severn Trent Laboratories - VI				Page of
Received By (Print Name):	L Dusti-	n		Log-in Date: 11/218
Received By (Signature):	LDIA	ti-	CORRESPONDI	NG
Case Number: 20000			ORRESPONDI	NO .
Sample Delivery KAL 200 Group No:	CLIENT	SAMPLE	ASSIGNED	REMARKS: CONDITION OF SAMPLE SHIPMENT,
ETR Number: 80708	SAMPLE #	TAG#	LAB#	ETC.
REMARKS:	W74103	NA	4.38493	Were air bubbles present
1. Custody Seal Present Absent	W7/102	\mathcal{V}_{-}	438494	in any VOA vials? MT
(Intac) Broken				Samples receive
2. Custody Seaf 1403.:	-		 	intact in coo
3. Chain-of-Custody	\leftarrow			with ice, cool
Records (Present libsent				received inter
4. Sample Information				as were custod
Sheets Present Absent *				Seals,
5. Airbill Airbild Sticker				
Present *				
6. Airbill No.: 823750545911				
7. Sample Tags Present Absend*				
Sample Tag				· ·
Numbers Listed Vot Listed				
on Chain-of-Custody				
8. Sample				
Condition: Intac#Broken*				
_Leaking				
9. Does information on the custody				
records, sample information sheets,				
sample tags and labels agree?				ND
Yest No.*	· ·			. , 1 .
10. Date Received at Lab: 11/20/00	١			11/21/2
11. Time Received:				
12. Cooler Temperature: 30				
Sample Transfer				
Fraction: A\				
Area #: LUY Frig.				
By: Joen Corso				
On: 1/20/00 0930 * Contact Project Director	I			
Reviewed by:			Logbook No.:	
Date:			Logbook Page 1	No.:

WERE CUSTODY SE	ALS PRESENT ON T	HE COOLERS?	•	
YES	NO		,	
IF SO, WERE THERE	CUSTODY SEAL N	UMBERS?		
YES	NO		•	
LIST THE CUSTODY	SEAL NUMBERS.		•	
WHAT TYPE OF COO	LING WAS UTILIZI	ED?		
ICE	MELTED ICE	PACKS	NONE	
COOLER TEMPERAT	TURE (degrees c):	30	·	
DATE AND TIME CO	OLER RECEIVED:	1/11/00	0930	;
DO SAMPLES APPEA	R TO BE INTACT:	YES	NO	
DO ANY SAMPLES H. (less than seven days)	AVE SHORT HOLDE	NG TIMES?		
WET CHE	M	YES	NO	
EXTRACT	ABLES	YES	NO.	
UNPRES V	OA	YES	NO	
RADIATION SCREEN	RESULTS <0.05 MR/	HR YES	NO	

WERE CUSTODY SEALS PE	RESENT ON T	HE COOLERS?	•
YES NO			
IF SO, WERE THERE CUSTO	ODY SEAL NU	MBERS?	
YES NO	<i>)</i>	,	
LIST THE CUSTODY SEAL	NUMBERS.		
WHAT TYPE OF COOLING	WAS UTILIZE	ED?	
(ICE) MELT	ED ICE	PACKS	NONE
COOLER TEMPERATURE (d	legrees c):	3-	
DATE AND TIME COOLER H	RECEIVED:	1/17/00	0930
DO SAMPLES APPEAR TO B	E INTACT:	YES	NQ
DO ANY SAMPLES HAVE SE (less than seven days)	ORT HOLDI	NG TIMES?	
WET CHEM		YES	NO
EXTRACTABLES		YES	NO
UNPRES VOA		YES	NO
RADIATION SCREEN RESUI	LTS <0.05 MR/	HR YES	NO

(* !)			
YES NO			
IF SO, WERE THERE CUSTODY SEAL N	NUMBERS?		
YES NO			
LIST THE CUSTODY SEAL NUMBERS.			
WHAT TYPE OF COOLING WAS UTILIZ	ZED?		
ICE MELTED ICE	PACKS	NONE	
COOLER TEMPERATURE (degrees c):			
DATE AND TIME COOLER RECEIVED:	11/18/00	1030	•
DO SAMPLES APPEAR TO BE INTACT:	YES	NO	
DO ANY SAMPLES HAVE SHORT HOLD (less than seven days)	OING TIMES?		
WET CHEM	YES	NO	
EXTRACTABLES	YES	NO	
UNPRES VOA	YES	NO	
) RADIATION SCREEN RESULTS < 0.05 M	R/HR VES	NO	

1043

SM.0002.031198

'YERN TRENT LABORATORIES -VT

WERE CUSTODY SEALS PRESENT ON T	HE COOLERS?		
YES NO			
IF SO, WERE THERE CUSTODY SEAL NU	JMBERS?		
YES NO			
LIST THE CUSTODY SEAL NUMBERS.			
WHAT TYPE OF COOLING WAS UTILIZE	ED?		
ICE MELTED ICE	PACKS	NONE	
COOLER TEMPERATURE (degrees c):	<u></u>	-	
DATE AND TIME COOLER RECEIVED:	11-20-00	930	·,
DO SAMPLES APPEAR TO BE INTACT:	YES	NO	
DO ANY SAMPLES HAVE SHORT HOLDI (less than seven days)	NG TIMES?		
WET CHEM	YES	NO	
EXTRACTABLES	YES	NO	
UNPRES VOA	YES	NO	

RADIATION SCREEN RESULTS < 0.05 MR/HR (

					438392	H38,391 mD	5W16588F	438.391	43839c	r,	43838S	438.387	73838C	4.38.385 md	438.385ms	43838S	4.38.384	438.383	52		Severn Trent La CLIENT: CASE: SDG: ETR NO: DATE: 477/31
1					W74097	W7409cmso	W TYOR MS	W74096	WTYCYS	MTYOGY	w74093	M74091	w74090		1	w74c92	W74089	W74088	Ę	L	
				<i>†</i>	<	_											-	080	1000	1000	Sample Vol. (1000ml). Measure entire sample volume using a Grad. Cylinder. Trans. to Sep. Funnel
					K	K	\	K	\sim	<u> </u>	<		<		<		<u> </u>	K	K	<	(DCB/TCX) 0.2 ppm
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					<													-	-	Kin	Rinse 1.0 Liter bottle and Grad. Cylinder w/ 60mls CH2CL2. Trans. to Sep. Funnel Shake 2 min. Decant thru
	K	1			J	-		_												89/KJ	Na2SO4 funnel into K-D set-up.
		1			_	-													1	BIRN	Repeat 2(A)
	1	1			_	_	_	_											-	(r)	Hexane Exchange w/60ml
	\prod				-																16ml vial.
		\downarrow			-	-		_										_	$ldsymbol{le}}}}}}$	6.1	(H2SO4) to sample. Shake for 1
					<																w/ 1-2 mls hexane, transfer rinse to K-D.
				}															^	VCF	Conc. to approx. 1.0 mL
						-													-	VKY	Add the extract to a 3 gram 3% deactivated silica gel column.
		_		/	 	-													-	V)[Elute w/ 60 mls Hexane
					2															0	Conc. to 1.0 mL. Transfer to a clear 2ml vial. Give extract clear 2ml vial. Give extract clear 2ml vial. Give extract clear 2ml vial. Give extract clear 2ml vial. Clear 2ml v
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STL Sample ID

D-061900-0L

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clear 2ml vial. Give extract w/paperwork to GC.

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STL Sample ID STL Sample Vol. (1000ml). Measure Client ID Client ID Client ID Control Cylinder. Trans. to Sep. Furnel Control Cylinder. Trans. to Sep. Furnel Control Cylinder. Trans. to Sep. Furnel Check PH between 5-9. If PH Paeds to be adjusted use 6N Chapth of 50% HSSO4. Check PH between 5-9. If PH Paeds to be adjusted use 6N Chapth of 50% HSSO4. Check PH between 5-9. If PH Paeds to be adjusted use 6N Chapth of 50% HSSO4. Check PH between 5-9. If PH Paeds to be adjusted use 6N Chapth of 50% HSSO4. Check PH between 5-9. If PH Paeds to be adjusted use 6N Chapth of 50% HSSO4. Check PH between 5-9. If PH Paeds to be adjusted use 6N Chapth of 50% HPSO4. Check PH between 5-9. If PH Paeds to be adjusted use 6N Chapth of 50% HPSO4. Check PH between 5-9. If PH Paeds to be adjusted use 6N Chapth of 50% HPSO4. Check PH between 5-9. If PH Paeds to be adjusted use 6N Conc. to 2.0-3.0 mL. Transfer to a Conc. to 2.0-3.0 mL. Transfer to a Conc. to 2.0-3.0 mL. Transfer to a Conc. to 3.0-3.0 mL. Transfer to a Conc. to 1.0 mL. Transfer to a								-		-		_			\mathbb{H}	-
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		743591 743591 764947	1.1.101/	MTX LOCHZOL					L O -	SPIKE WITNI Cu LOT	FLORIS			1/29/07 1/29/07	こをひば	ASE TR NO:
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DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# KAL294

PCB ANALYSES

WILLOW BOULEVARD GROUNDWATER SAMPLING

Analyses performed by:

Severn Trent Laboratories Colchester, Vermont

Review performed by:

BBL BLASLAND, BOUCK & LEE, NC.

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the data package for SDG# KAL294 for the analysis of groundwater samples from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

			Sample			Analyses		
Sample ID	Lab ID	Matrix	Date	VOA	BNA	РСВ	TAL	тос
W74105	438682	water	11/19/00			×		
W74104	438683	water	11/19/00			х		
W74110	438684	water	11/19/00			×		
W74108	438685	water	11/19/00			×		
W74111	438686	water	11/19/00			х		
W74106	438687	water	11/20/00			х		
W74107	438688	water	11/20/00			х		
W74112	438689	water	11/20/00			×		
W74113	438690	water	11/20/00			x		
W74109	438691	water	11/20/00			x		

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PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by STL (formerly known as Aquatec, Inc.) in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of water samples are 5 days from date of sample receipt to extraction and 40 days from extraction to analysis. The technical holding times are 7 days from sample collection to extraction and 40 days to analysis.

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No Aroclors were detected in the method or rinse blanks.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibrations were within the specified limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All the continuing calibration standards were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for one surrogate was above control limits in samples W74105, W74104, W74106, W74107, W74112 and W74113. Since recoveries for the second surrogate were within control limits, no data have been qualified based on the deviations. All other sample surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

Aroclor 1232 was reported as present in sample K74112. An examination of the sample chromatograms showed no Aroclor 1232 to be present in the sample. Data for the Aroclor has, therefore, been qualified as undetected. A further examination of the chromotgrams showed a poor pattern match for Aroclor 1242 in sample K74113. Data for the Aroclor has been qualified as estimated with presumptive evidence of identification based on the poor match. All other Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Due to insufficient sample volume, no matrix spike/matrix spike duplicate analyses were performed on the samples in this data set. All matrix spike blank recoveries were, however, within control limits.

8. Field Duplicates

No field duplicates were included in this data set.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		·
Are the sample numbers included in the narrative?	X		·
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	transmiss	X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Were surrogate recoveries outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		X	
Matrix Spikes			
Is there a matrix spike recovery form present?		X	
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
NA out of NA			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
NA out of NA			
Blanks			٠
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/instrument blanks have positive results?		X	
Are there field/rinse blanks associated with every sample?	X		\ <u>\</u>
Do any field/rinse blanks have positive results?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?	•		
Aroclor 1016	X		
Aroclor 1221	X		
Aroclor 1232	X		

PCB Data Review Checklist - Page 2

	YES	NO	NA
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Aroclor 1260	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	x		<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	x		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	x		
ls a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		*****
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	x		
Do the combined column and individual column Aroclor identifications agree?	x		
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			Х
Compound Quantitation and Reported Detection Limits			
Are the reporting limits adjusted to reflect sample dilutions, and, for soils, sample moisture?			X
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate **Recovery Summary**

Sample ID	Holding Time	Surrogates				
		TCX-1	TCX-2	DCB-1	DCB-2	
W74105			<u> </u>		t	
W74104			·		1	
W74110						
W74108						
W74111						
W74106				ī	!	
W74107				1	ī	
W74112				1	11	
W74113					1	
W74109						
				·		
			<u> </u>			
		1				

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl Qualifiers:

D Surrogates diluted out

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP2865</u> Column: <u>RTX-5 / RTX-35</u>

Date:	11/27/00	11/28/00	11/28/00	11/28/00	11/28/00	11/29/00	11/29/00	
Time:	11/28/00	12:09	12:33	17:33	17:56	21:24	21:47	
	Initial Cal	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont Cal.
	%RSD	%D						
Aroclor 1016	ok							
Arocior 1221	ok							
Aroclor 1232	ok							
Arocior 1242	ok		ok					
Arocior 1248	ok	ok		ok		ok		
Aroclor 1254	ok				ok			<u> </u>
Aroclor 1260	ok						ok	
Tetrachloro-m-xylene	ok							<u> </u>
Decachlorobiphenyl	ok		t 					
Affected Samples:		·						
								!
								i

CORRECTED ANALYSIS SUMMARY FORMS

ì	Ti Danka saa			a=1.1=		W74104	
Lab Name: S	IL Burnington		Lab Code: _	STLVT	L		
` Contract:	20000		Case:	20000	SDG:	KAL294	
Phase Type:	WATER		Lal	b Sample ID:	438683		
Phase Weight:	990.	(mL)	Da	te Received:	11/22/00		
Injection Volume:	1.0	(uL)	Dat	te Extracted:	11/25/00		
Dilution Factor:	1.0		Da	te Analyzed:	11/29/00		
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

COMPOUND	CONCENTRATION	QUALIFIER
	ug/L	
Aroclor-1016	0.051	U
Aroclor-1221	0.051	υ
Aroclor-1232	0.051	U
Aroclor-1242	0.066	
Aroclor-1248	0.051	U
Aroclor-1254	0.027	J
Aroclor-1260	0.051	U
	Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242 Aroclor-1248 Aroclor-1254	ug/L Aroclor-1016 0.051 Aroclor-1221 0.051 Aroclor-1232 0.051 Aroclor-1242 0.066 Aroclor-1248 0.051 Aroclor-1254 0.027

FORM 1 AROCLOR ANALYSIS DATA SHEET EPA SAMPLE NO.

					1	N74105	
Lab Name: S	TL Burlington		Lab Code:	STLVT			
Contract:	20000		Case:	20000	SDG:	KAL294	
Phase Type:	WATER		Lab S	ample ID:	438682		
Phase Weight:	990.	(mL)	Date F	Received:	11/22/00		
Injection Volume:	1.0	(uL)	Date E	extracted:	11/25/00		
Dilution Factor:	1.0		Date A	Analyzed:	11/28/00		
% Solids:	· · · · · · · · · · · · · · · · · · ·		Sulfur (Clean-up:	N	((Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	U	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	0.051	U	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroclor-1248	0.051	U	
1097-69-1	Aroclor-1254	0.051	U	
096-82-5	Aroclor-1260	0.051	U	

				,	N74106
_ab Name:	STL Burlington	·	Lab Code: STLVT		
Contract:	20000		Case: 20000	SDG:	KAL294
Phase Type:	WATER		Lab Sample ID:	438687	· .
Phase Weight:	990.	(mL)	Date Received:	11/22/00	
Injection Volume:	1.0	(uL)	Date Extracted:	11/25/00	
Dilution Factor:	1.0	-	Date Analyzed:	11/29/00	
% Solids:			Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	υ
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
096-82-5	Aroclor-1260	0.051	U

						W74107
_ab Name:	STL Burlington		Lab Code:	STLVT		
Contract:	20000		Case:	20000	SDG:	KAL294
Phase Type:	WATER		La	b Sample ID:	438688	
Phase Weight:	990.	(mL)	Da	te Received:	11/22/00	·
njection Volume:	1.0	(uL)	Da	te Extracted:	11/25/00	
Dilution Factor:	1.0		Da	te Analyzed:	11/29/00	i
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	υ
12672-29-6	Aroclor-1248	0.051	υ
11097-69-1	Aroclor-1254	0.051	U
096-82-5	Aroclor-1260	0.051	Ū

EPA SAMPLE NO.

(Y/N)

		•				W74108
Lab Name:	STL Burlington		Lab Code:	STLVT		
Contract:	20000		Case:	20000	SDG: _	KAL294
Phase Type:	WATER		Lat	Sample ID:	438685	
Phase Weight:	990.	(mL)	Dat	e Received:	11/22/00)
Injection Volume:	1.0	(uL)	Dat	e Extracted:	11/25/00)
Dilution Factor:	1.0		Dat	e Analyzed:	11/29/00)

% Solids:

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
1096-82-5	Aroclor-1260	0.051	U

Sulfur Clean-up:

						W74109	
Lab Name: S	TL Burlington		Lab Code:	STLVT	<u> </u>		
Contract:	20000		Case:	20000	SDG: _	KAL294	
Phase Type:	WATER		Lal	o Sample ID:	438691		
Phase Weight:	990.	(mL)	Da	te Received:	11/22/00		
Injection Volume:	1.0	(uL)	Dat	e Extracted:	11/25/00) 	
Dilution Factor:	1.0		Dar	te Analyzed:	11/29/00		
% Solids:		-	Sulf	ur Clean-up:	N		/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Aroclor-1242	0.051	U
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
1096-82-5	Aroclor-1260	0.051	U

•						W74110	
ib Name: ≤	STL Burlington	•	Lab Code:	STLVT]
Contract:	20000		Case:	20000	SDG:	KAL294	
Phase Type:	WATER		Lab	Sample ID:	438684		
Phase Weight:	990.	(mL)	Date	Received:	11/22/00	·	
Injection Volume:	1.0	(uL)	Date	Extracted:	11/25/00		
Dilution Factor:	1.0		Date	Analyzed:	11/29/00		
% Solide:			Solfu	r Clean-un'	N	(Y	/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	U	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	0.051	U	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroclor-1248	0.051	U	
11097-69-1	Aroclor-1254	0.051	υ	
'096-82-5	Aroclor-1260	0.051	U	

				,	W74111
_ab Name: S	TL Burlington		Lab Code: STLVT		
·Contract:	20000		Case: 20000	SDG:	KAL294
Phase Type:	WATER		Lab Sample ID:	438686	
Phase Weight:	990.	(mL)	Date Received:	11/22/00	
Injection Volume:	1.0	(uL)	Date Extracted:	11/25/00	
Dilution Factor:	1.0		Date Analyzed:	11/29/00	
% Solids:			Sulfur Clean-un:	N	 (Y/N)

CAS NO.	COMPOUND	CONCENTRATION	QUALIFIER	
		ug/L		
12674-11-2	Aroclor-1016	0.051	U	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	0.051	U	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroclor-1248	0.051	U	
11097-69-1	Aroclor-1254	0.051	U	
096-82-5	Aroclor-1260	0.051	U	

				,	W74112
_ab Name: _S	TL Burlington		Lab Code: STLVT		
Contract:	20000		Case: 20000	SDG:	KAL294
Phase Type:	WATER		Lab Sample ID:	438689	
Phase Weight:	990.	(mL)	Date Received:	11/22/00	
Injection Volume:	1.0	(uL)	Date Extracted:	11/25/00	
Dilution Factor:	1.0		Date Analyzed:	11/29/00	
% Solide:			Sulfur Clean-un	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.051	U	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	0.082 - ∂.0∑\	U	
53469-21-9	Aroclor-1242	0.051	U	
12672-29-6	Aroclor-1248	0.051	U	
11097-69-1	Aroclor-1254	0.051	U	
1096-82-5	Aroclor-1260	0.051	U	

						W74113
_ab Name: S	TL Burlington		Lab Code: _	STLVT		····
Contract:	20000		Case:	20000	SDG:	KAL294
Phase Type:	WATER		Lat	Sample ID:	438690	·
Phase Weight:	990.	(mL)	Dat	te Received:	11/22/00	
Injection Volume:	1.0	(uL)	Dat	e Extracted:	11/25/00	
Dilution Factor:	1.0		Dat	te Analyzed:	11/29/00	
% Solids:			Sulfi	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	υ
53469-21-9	Aroclor-1242	0.069	Nic
12672-29-6	Aroclor-1248	0.051	υ
11097-69-1	Aroclor-1254	0.051	U
096-82-5	Aroclor-1260	0.051	υ

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SUPPORTING DOCUMENTATION



STL Burlington 208 South Park Drive Suite 1

Colchester, VT 05446

Tel: 802 655 1203 Fax: 802 655 1248 www.stl-inc.com

December 1, 2000

Ms. Laurie Indick Blasland & Bouck Engineers 6723 Towpath Road Box 66 Syracuse, NY 13214

Re: Laboratory Project No. 20000

Case: 20000; SDG: KAL294

Dear Ms. Indick:

Enclosed are the analytical results of samples received intact by Severn Trent Laboratories on November 22, 2000. Laboratory numbers have been assigned and designated as follows:

	Client	Sample	Sample
Lab ID	Sample ID	<u>Date</u>	<u>Matrix</u>
	Received: 11/	22/00 ETR No: 80°	737
	10001104. 11	ZZIOO ZIRIO. OO	, , ,
438682	W74105	11/19/00	Water
438683	W74104	11/19/00	Water
438684	W74110	11/19/00	Water
438685	W74108	11/19/00	Water
438686	W74111	11/19/00	Water
438687	W74106	11/20/00	Water
438688	W74107	11/20/00	Water
438689	W74112	11/20/00	Water
438690	W74113	11/20/00	Water
438691	W74109	11/20/00	Water

Please note that the PCB Aroclor software identified Aroclor 1232 in the analysis of sample W74112. Although this was a poor fit to the calibration standards, it appeared to be the closest match of the other Aroclors.

If there are any questions regarding this submittal, please contact James Madison at (802) 655-1203.



STL Burlington

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I certify that this package is in compliance with the NELAC requirements, both technically and for completeness, for other than the conditions detailed above. The release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Sincerely,

Christopher A. Ouellette Laboratory Director

CAO/mpg Enclosure

FORM 2 AROCLOR SURROGATE RECOVERY

Lab Name:	STL Burlington	Contract:	20000	•
ode:	STLVT	Case:	20000	
SAS No:		SDG:	KAL294	_

EPA	TCX 1	TCX 2	DCB 1	DCB 2
SAMPLE NO.	% REC #	% REC #	% REC #	% REC #
PBLKB4	132	136	153 *	159 *
PLCSB4	56 •	55 *	93	· 98
W74105	105	107	148	153 *
W74104	115	116	150	155 *
W74110	111	117	146	150
W74108	129	128	144	149
W74111	110	116	123	129
W74106	135	140	167 *	175 *
W74107	115	118	163 *	169 *
W74112	122	123	156 *	162 *
W74113	127	132	147	153 *
W74109	115	120	126	131

Project Specific QC Limits (60 - 150) (60 - 150)

TCX = Tetrachloro-meta-Xylene DCB = Decachlorobiphenyl

- Column to be used to flag recovery values lues outside of QC limits arrogates calculated using diluted analysis

A - Extracted surrogates diluted out, surrogates added to diluted extract as retention time markers.

FORM 3E AROCLOR MATRIX SPIKE BLANK RECOVERY

I ah Name:	STL Burlington	· · · · · · · · · · · · · · · · · · ·	Contract:	20000	
سے Code:	STLVT		Case: _	20000	_
SAS No:			SDG: _	KAL294	_
EPA SAMP	LE NO.:	PLCSB4			

Compound	SPIKE ADDED ug/L	MSB CONCENTRATION ug/L	MSB % REC #	QC LIMITS REC.
Aroclor 1242	0.50	0.21	42	39-150
Aroclor 1254	0.50	0.24	48	29-131

- Column used to flag recovery and RPD values with an as
--

	_		_	
Spike Recovery:	0	out of	2	outside limits

"nments:

^{* -} Values outside of QC limits.

FORM 4 AROCLOR METHOD BLANK SUMMARY

Lab Name:	STL Burlington	Contract:	20000
,ode:	STLVT	Case:	20000
b Sample ID:	PBLKB4	SDG:	KAL294
Matrix:	WATER	_	LOW
ite Extracted:	11/25/00	Level:	·
Analyzed(1):	11/28/00	Date Analyzed(2):	11/28/00
Analyzed(1):	20:08	Time Analyzed(2):	20:08
GC ID(1):	HP2865	GC ID(2):	HP2865
C Column(1):	RTX-5	GC Column(2):	RTX-35
			

LAB ID	CLIENT ID	DATE ANALYZED 1	DATE ANALYZED 2
PLCSB4	PLCSB4	11/28/00	11/28/00
438682	W74105	11/28/00	11/28/00
438683	W74104	11/29/00	11/29/00
438684	W74110	11/29/00	11/29/00
438685	W74108	11/29/00	11/29/00
438686	W74111	11/29/00	11/29/00
438687	W74106	11/29/00	11/29/00
438688	W74107	11/29/00	11/29/00
438689	W74112	11/29/00	11/29/00
438690	W74113	11/29/00	11/29/00
438691	W74109	11/29/00	11/29/00

						PBLKB4	
b Name: S	TL Burlington		Lab Code:	STLVT			
Contract: _	20000		Case:	20000	SDG:	KAL294	
Phase Type:	WATER		Lat	Sample ID:	PBLKB4	l	
Phase Weight:	1000.	(mL)	Da	te Received:			
njection Volume:	1.0	(uL)	Dat	e Extracted:	11/25/00		
Dilution Factor:	1.0		Dat	te Analyzed:	11/28/00)	
% Solids:			Sulfi	ur Clean-un	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.050	U	
11104-28-2	Aroclor-1221	0.050	U	
11141-16-5	Aroclor-1232	0.050	U	
53469-21-9	Aroclor-1242	0.050	U	
12672-29-6	Aroclor-1248	0.050	U	
11097-69-1	Aroclor-1254	0.050	U	
096-82-5 Aroclor-1260		0.050	U	

JLB - HP2865

Aroclor Calibration Summary
Calibration of 27-Nov-2000 11:11 through 28-Nov-2000 00:22.
MCD1:[8080] 49.50 27NOV001002

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

Peak #	RT	Aroclor		Aroclor	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
1	3.318	91.834	2.2	53.047	1.6%	1.179		1.239							
2	3.743	22.903	13.5%	13.164	8.9%	2.722		4.263		2.558		3.274		3.134	
3	4.229	110.603	4.4%	77.139	3.7%	30.141	3.41	27.528	5.4%	3.110		1.458		1.051	
4	4.323						3.1.	27.320	3.44	10.902	5.14	10.310	9.4%	9.810	12 21
5	4.351	85.419	2.81	67.631	2.6%	41.712	3.2%	38.080	4.2%	10.502	3.14	10.310	9.44	3.810	12.28
6	4.420	287.476	0.9%	249.174	0.91	195.676	1.94	174.272	1.4	17.439	3.3%	2.713		1.945	
7	4.672	2.075		12.020	3.2%	26.463	1.3%	22.096	4.3%	6.142	3.34	2./13			
8	4.895	17.236	7.4%		3.2.	201103	1131	22.096	4.31	0.142				0.516	
9	4.944			155.879	2.3%	338.887	4.0%	283.453	3.8%	147.010	2.8%				
10	5.080	4.730		19.187	2.5%	41.094	2.0	34.059	4.1%	7.931		0 777			
11	5.202	19.984	15.0%	128.894	0.7%	289.254	0.9%	240.526	0.8	98.896	12.7% 2.8%	0.737	40	5 003	0.7
12	5.315	7.163	9.2%	8.703	14.3%	10.081	9.4%	9.743	10.2%	7.535		6.262		5.003	
13	5.359			• • • • • •		5.858	13.4%	4.858	10.25	7.535	8.9%	7.524	9.3%	7.518	9.2
14	5.434	7.241	43.	31.132	9.9%	66.669	2.4	55.811	12.0%	19.099	10	2 521		3 000	
15	5.572	28.500	5.4%	255.639	4.18	601.337	1.9%	491.962	2.3%		19. 2.4%	3.521	71.	3.089	B.1%
16	5.739	19.285	• • • • • • • • • • • • • • • • • • • •	136.265	2.0%	310.032	1.3%	254.730	1.28	298.909 128.818	2.48	8.966	6.8%	3.843	B.1%
17	5.859	8.932	7.5%	78.460	7.0%	188.296	5.2%	152,209	5.7%	75.709	5.0%	7.016	22	1.210	
18	5.951	0.741		23.954	4.9%	65.598	2.0%	52.591	2.0%	66.181	1.8%	2.144 1.710	22.	0.351	
19	6.120	7.264	10.	77.581	0.7%	195.179	4.0%	164.296	2.84	312.942			2.7%	13.433	3.0%
20	6.194	5.920	38.	75.798	4.3%	189.843	3.6%	157.371	4.3	249.399	3.4%	240.929			
21	6.255			50.056	1.0%	129.980	3.0%	106.931			3.7%	68.892	4.6	4.384	вв.
22	6.493	5.098	6.0%	98.108	2.5%	246.538	1.3%	209.166	2.8%	157.058	3.51			2 400	
23	6.552	3.877	17.	63.247	3.7%	130.449	1.5%	128.453	1.0%	375.271 156.357	0.8%	137.359	1.7%	2,409	
24	6.715	3.807	9.21	97.073	3.24	215.811	1.7%	212.059	1.8%	346.983	0.9%	40 100		1.014 2.047	
25	6.884	0.821	7.2.	25.480	7.1%	44.763	5.0%	54.070	3.7%		1.3%	49.172	3.4%		15.
26	7.059	0.121		3.349	14.9%	1.807	3.04	7.871		86.800	2.6%	8.195	8.4	0.391	
27	7.133	1.659		44.855	6.01	17.524	6.31		9.4%	13.605	9.3%	1.627		0 710	
28	7.212	4.637	8.7%	85.205	3.7%	28.507	4.5%	100.339 185.534	3.4%	175.559 359.190	3.1% 1.1%	39.773	5.1% 2.2%	0.712	
29	7.287		0	84.611	4.1%	20.307	4.54	181.105	1.8%	324.800		172.799	2.28	2.026	
30	7.311	8.249	6.5%	01.011	3.10	27.446	2.9%	161.105	1.54	324.800	1.2%	400 504	2 54	166 260	1.4%
31	7.443	0.988	0.5.	6.338	7.7%	3.846	8.4%	16.229	3.6%	43 004	1 (1	409.804 65.869	2.5%	166.260 0.787	1.44
32	7.644	4.059	11.3%	80.902	6.34	6.455	7.1%	178.809	5.2%	43.804 319.285	1.6% 5.5%	124.734	1.8%	25.671	2.9%
33	7.761	10.464	6.1%	30.479	3.6%	5.346	8.0%	76.102	1.3%	210.330	2.3%	623.319	2.8%	207.937	2.5%
34	7.871	2.771	0.10	12.522	7.1%	0.982	8.01	35.040	3.3%				1.7%	2.941	2.54
35	8.011	0.208		0.430	7.15	0.962		1.490	3.35	94.949	1,5%	199.859		2.941	
36	8.131	0.566		2.104		0.180		5.571	C 08	4.136	12.7%	7.236	5.4%	0 717	
37	8.245	2.450		10.709	5.1%	0.520		27.951	6.8% 2.7%	15.622 79.603	3.2%	31.460	1.7%	0.717	4.1%
38	8.363	4.680	10.7%	17.307	5.6%	0.695		45.227	3.1%	128.837	0.9% 2.2%	174.744 360.086	2.7%	6.592 35.647	
39	8.459	1.377	10.74	9.654	10.1%									33.64/	2.9%
40	8.545	2.3//		2.034	10.14	0.284		26.421	5.9%	75.210	2.3%	106.135	2.1%	00 150	2 46
41	8.590	8.926	5.0%	29.528	4.9%	0.000		25 350	2 20	017 000		COC 855		92.150	2.4%
42	8.866	1.716	5.04	8.748		0.868		75.352	3.3%	217.902	1.4%	696.759	1.4%	117.139	1.2%
43	B.971	0.961			8.6%	0.192		21.033	6.0%	62.456	3.4%	128.982	1.8%	235.017	1.7%
44	9.063	0.306		1.402 1.153				3.219	11.1%	9.777	9.5%	84.132	1.8%	143.344	1.1%
45	9.151	9.518		1.153		2 600		3.723	11.24	10.921	10.5%	37.866	4.6%	n	
73	3.131	3.518				3.622								541.210	3.5%

Notes:

ington

¹⁾ Retention times linearly adjusted to place tetrachloro-meta-xylene at 3.9707 and decachlorobiphenyl at 14.3552.

²⁾ Peaks chosen within window of +/- 0.01184 of the mean RT of corresponding peaks in all mixtures.

³⁾ Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.14239.

JLB - HP2865

Aroclor Calibration Summary
Calibration of 27-Nov-2000 11:11 through 28-Nov-2000 00:22.

MCD1: [8080] 49,50 27NOV001002

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

76 77 78 79 80	13.016 13.244 13.321 13.498 13.563 13.961	0.403 5.269 838.2	14.4* :===== 3.4*	0.465 0.653 5.055	11.7%	4.996 3471.4 2.5	0.428 5.680 4001.4	30.	0.508 1.188 5.975	14.8%	1.973 0.526 2.972 5.068	2.54	132.407 9.860 313.864 20.102 111.584	2.0% 5.6% 1.4% 3.4% 1.1%
76 77 78 79 80	13.244 13.321 13.498 13.563 13.961		14.4%	0.653	11.7%	4.996		30.	1.188	14.8%	1.973 0.526 2.972		132.407 9.860 313.864 20.102	2.0% 5.6% 1.4% 3.4%
76 77 78 79	13.244 13.321 13.498 13.563			0.653					1.188		1.973 0.526 2.972	****	132.407 9.860 313.864 20.102	2.0% 5.6% 1.4% 3.4%
76 77 78	13.244 13.321 13.498	0.403					0.428				1.973 0.526	1.11	132.407 9.860 313.864	2.0% 5.6% 1.4%
76 77	13.244 13.321	0.403					0.428				1.973 0.526		132.407 9.860	2.0% 5.6%
76	13.244										1.973		132.407	2.0%
75											2.546	4.1%	15.240	5.3
	12.799	0.240		0.580					1.142		2.773		285.865	1.1%
	12.717	0.289		0.551					1.052		2.671		252.594	1.2%
	12.591	0.489		1.561			0.787		3.283	7.4%	71.197	4.2%	608.564	2.4%
	12.299												32.730	2.7%
	12.182								0.137		2.315	5.7%	20.797	4.6
	12.058	1.064		3.081	3.8%		0.951		5.192	4.0%	69.413	2.1%	1053.237	1.1%
68	11.933			0.164					0.315		7.240	5.6%	78.339	2.4%
67	11.850	0.532		0.215			0.696		1.053		17.470	6.7%	38.773	2.1
66	11.726	0.360		0.600			2.019		4.161	9.9%	83.910	5.0%	156.297	1.6
	11.622	0.256		0.644			0.127		1.004		19.154	4.7%	243.463	1.7%
	11.500	0.487		1.250			0.264		1.863		30.805	3.9%	445.611	0.6%
	11.304			0.136						=	3.544	•	60.205	3.1%
	11.202	0.931		0.801			. 4.024	7.7%	9.048	5.7%	151.586	3.0%	55.998	2.7
	11.022	0.234		0.551			0.145		0.808		15.706	5.61	196.502	1.2
	10.890	0.644		1.454					1.732		18.708	3.2%	371,792	2.91
	10.810			5.550			2.100		5.2.5				15.250	5.1%
	10.676	0.415		0.656			1.168	5.2.	3.273	4.8	41.854	4.13	78.515	1.4%
	10.456	4.739	12.1%	4.522	7.7%		11.633	8.24	28.640	1.8%	497.633	1.1%	630,470	0.7%
	10.317	0.233		0.570			0.976		2.737		41.049	2.91	64.048	2.1%
	10.242	0.243		0.378			0.972		2.508		38.096	4.6%	1.744	5.7.
	10.126	5.677		0.639		•	1,715		3.047	,,,,,	57.740	2.7	135.284	3.9%
	10.063	0.677		1.135	40.		1.715		5.647	7.48	87.746	2.91	234.108	2.6
52	9.855	6.655	3.78	17.016	40.		44.334	24.	118.672	14.78	370.273	5.48	223.667	3.24
51	9.724	2.948	9.7%	3.100	11.1%		5.475	7.5%	14.280	5.2	259.817	1.91	578.683	3.21
49 50	9.577	0.452		0.449 0.502			1.409 1.124		3,436	11.14	50.695	2.41	84.092	1.5%
48	9.460 9.529			0.811				11.3%	7.603 4.256	10.9% 11.1%	15.508			
47	9.421	0.434							7 (01	10.01	37.003	3.31	33,430	2.00
46	9.178	5.833		16.005	3.8%	0.571	44.141	2.3%	119.972	1.4%	470.762 37.063	0.9% 3.5%	35.456	2.8%
Peak #	RT	Aroclor	1221	Aroclor		Aroclor 1016			Aroclor		Aroclor		Aroclor	1260

Retention Time Marker/Surrogate Standard Summary

Compound	Mean RT	RT Dev. Range	RT Crit.	Mean RF	Recovery Range	Surr Crit
tetrachloro-meta-xylene	3.9707	0107 to .0093	Passes	13497.137	73.6 to 107.9%	** Fails *
decachlorobiphenyl	14.3552	0108 to .0070	Passes	16370.487	95.5 to 112.7%	Passes

Notes:

- 1) Retention times linearly adjusted to place tetrachloro-meta-xylene at 3.9707 and decachlorobiphenyl at 14.3552.
- 2) Peaks chosen within window of +/- 0.01184 of the mean RT of corresponding peaks in all mixtures.
- 3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.14239.

RTX-35

JLB - HP2865

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

Peak #	RT	Aroclor	1221	Aroclor	1232	Aroclor	1016	Aroclo	1242	Aroclor	1349	Aroclor	. 1264	Aroclor	- 1260
1	3.274	4.702	10.6%	4.913	10.4%	4.582	9.61	4.520	6.78	4.401	4.6%	4.536	6.7%	4.440	5.91
2	4.226	134.719	4.8%	77.943	2.4%	4.246		5.338	40.	2.352	1.00	3.519	0.14	3.067	3.7.
3	5.128	39.851	2.2%	34.037	3.5%	24.244	1.7%	21.949	3.2%	1.791		3.519		3.067	
4	5.313	159.023	3.1%	114.783	3.5%	51.852	2.6%	49.473	4.0%	15.552	6.1%	13.887	5.9%	13.789	4.91
5	5.551	108.913	1.5%	85.211	1.5%	51.095	1.5%	46,229	2.0%	2.964	0.11	0.354	3.34	0.320	4.91
6	5.660	352.290	0.8%	310.179	0.9%	254.300	2.2%	223.859	1.9%	22.607	5.6%	3.458	28.	2.876	56
7	5.738	50.689	3.4%	34.654	3.1%	13.562	2.2.	12.639	1.7.	22.007	3.03	3.450	20.	2.876	36.
8	6.296	18.654	5.4%	10.850	4.1%	3.253		3.417							
9	6.430	59.627	5.2%	239.495	3.7%	501.694	4.9%	416.877	4.6%	202.372	5.0%	9.073	21	6.051	61.
10	6.640	2.830		16.497	7.1%	36.561	3.5%	30.692	3.0%	7.802	7.0%	0.381	21.	0.188	61.
11	6.840	8.328		67.446	4.6%	156.902	1.5%	128.663	1.4%	60.997	3.3%	0.301		0.188	
12	6.965	14.791		98.000	0.9%	217.855	1.7%	179.286	2.1%	65.003	0.7%	3.339		1.843	
13	7.058	4.938	9.6%	20.689	6.6%	44.009	3.84	36.455	3.4%	5.813	0.7.	0.386		0.207	
14	7.232	34.014	1.7%	284.962	2.4%	664.779	1.4%	541.857	1.7%	329.736	0.7%	10.746		4.818	
15	7.553	18.616	4.4%	136.472	1.6%	309.932	0.7%	253.987	0.6%	119.025	1.1%	3.911	9.2%	2.157	
16	7.654			16.900	7.3%	45.451	2.4%	36.506	3.1%	52.410	2.4%	4.437	12.7%	0.222	
17	7.751	0.146		5.677	11.8%	16.644	5.9%	12.897	7.5%	17.285	5.5%	0.314		0.222	
18	7.825	11.664	6.8%	94.819	5.4%	224.168	4.4%	180.874	4.0%	88.248	4.2%	2.406	7.8%	1.322	
19	7.970	6.874		80.058	1.3%	203.305	3.2%	169.545	2.9%	326.135	4.0%	261.377	2.31	14.402	
20	8.071	4.442		87.181	1.0%	223.100	2.7%	183.346	2.7%	286.849	3.0%	69.903	0.9%	2.249	
21	8.127	2.565		35.810	2.4%	94.537	1.3%	77.017	1.4%	123.269	0.6%			0.927	
22	8.200	1.265		34.404	2.5%	92.412	1.2%	74.716	1.4%	103.248	1.4%	4.555	3.8%	0.685	
23	8.308	0.261		8.879	7.8%	24.606	4.8%	19.631	5.0%	27.091	3.7%	0.729		0.160	
24	8.677		12.1%	122:379	1.8%	286.818	0.8%	253.996	1.2%	417.532	1.0%	151.508	0.9%	3.851	
25	8.766	1.980		44.499	2.4%	108.047	1.2%	92.874	1.9%	138.849	0.8%	10.982	7.7%	1.265	
26	8.926	1.125		36.097	5.5%	83.484	2.0%	77.226	3.3%	129.470	0.7%	9.558		0.599	
27	8.986	2.668	18.	74.211	4.4%	157.868	2.3%	163.459	2.9%	281.832	1.7%	48.882	5.4%	1.231	
28	9.073	0.743		26.308	7.3%	60.723	3.5%	58.024	4.91	72.312	1.8%			0.398	
29	9.210			4.346	14.2%	2.056	11.9%	10.300	14.1%	17.504	1.9%	1.895			
30	9.301	2.022		50.916	4.0%	19.238	4.6%	112.294	2.4%	194.805	0.9%	44.205	3.8%	1.012	
31	9.426					61.007	3.2%								
32	9.445	5.831	4.2%	105.557	2.4%			227.368	1.1%	433.736	0.3%	199.218	2.0%		14.1%
33	9.585	4.057	33.	91.072	3.0%	22.722	2.2%	193.072	1.5%	339.080	0.8%	60.226	1.5%	1.960	29.
34	9.735	6.717	5.7%	17.266	6.3%	17.436	4.3%	42.539	4.14	126.019	2.0%	397.191	1.84	170.017	1.8%
35	9.857	1.390		3.398		0.367		9.413	11.2%	28.428	1.3%	102.440	2.3%	25.293	4.0%
36	9.939	1.070		8.333	9.3%	4.019	8.1%	21.175	6.4%	47.034	1.3%	67.557	3.0%		
37	10.028	7.760	7.2*	18.423	6.1%	1.945		47.534	3.2%	134.300	2.1%	497.188	2.2%	213.564	1.9%
38	10.203	3.001	8.2%	12.934	3.7%	1.179		36.505	2.5%	99.806	1.3%	209.777	1.2%	2.216	
39	10.268	3.140	4.5%	91.882	4.8%	6.847	11.8%	200.323	4.4%	345.408	4.5%			1.756	
40	10.374									6.836		7.741	9.7%		
41	10.557		11.5%	10.462	8.0%		10.6%	28.202	4.2%	80.955	2.2%	165.598	1.2%	8.376	3.6%
42	10.722	0.496		2.091	1.6%	0.172		5.709	3.8%	16.226	5.1	33.719	4.8%	0.649	
43	10.899	2.885		11.848	4.1%	0.710		30.890	2.9%	88.848	1.7%	189.535	0.9%	7.033	4.5
44	11.087	5.232		16.119	2.9%	1.282		41.255	2.6%	120.919	2.5%	363.158	3.4%	38.903	1.4
45	11.244	1.372		10.205	9.1%	0.488		28.649	4.7%	83.037	3.7%	116.448	4.1%	0.550	
46	11.372	9.993	6.9%	30.498	5.6%	1.014		80.589	2.31	245.866	1.9%	821.895	1.8%		

Notes:

STL B. lington

¹⁾ Retention times linearly adjusted to place tetrachloro-meta-xylene at 4.7225 and decachlorobiphenyl at 16.4242.

2) Peaks chosen within window of +/- 0.01184 of the mean RT of corresponding peaks in all mixtures.

³⁾ Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.12889.

JLB - HP2865

Aroclor Calibration Summary
Calibration of 27-Nov-2000 11:11 through 28-Nov-2000 00:22.

MCD1: [8080] 49,50 27NOV001002

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

<u>Peak #</u>	RT 11.421	Aroclor	1221	Aroclor	1232	Aroclor 0.827	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
48	11.421	0.705		1 040		0.827		3.336	17	10.565	14 0%	75.586	1.2%	110.016	1.9%
49	11.489			1.049				3.330	17.	10.505	14.04	58.235	0.9%	113.416	2.3
50	11.636	0.539		1.413				5.095	9.7%	14.480	10.25	30.233	0.54	113.410	2.34
51	11.757	4.849	13.84	18.408	6.0%	0.379		55.981	2.6%	153.637	1.9%	514.251	0.7%		
52	11.813	4.430	13.01	18.400	0.01	0.375		33.961	2.00	155.057	1.74	322.364	2.7	676.070	3.4%
53	11.845	4.430		11.372	4.7%	0.351		28.414	3.4%	84.131	2.5%	322.304	2.,,	470.070	3.44
54	11.959	0.656		0.508	4.75	0.331		1.368	3.45	4.618	15.	66.963	0.8%	114.976	3.1%
55	12.097	3.951	8.3%	4.353	9.9%	•		8.647	5.8%	23.663	7.4%	350.163	2.2%	788.353	3.6%
56	12.216	3.931	0.34	0.715	3.34			1.818	3.01	5.719	12.0	330.103	2.2.	700.555	3.00
57	12.233	0.299		0.713				4.375		3.725	12.00	18.447	3.2%	8.188	23.
58	12.452	1.227		1.660				2.619		7.736	4.7%	125.133	3.6%	350.928	4.3
59	12.533	11.614		24.375				64.757		174.767	19.	346.350	14.7%	330.320	
60	12.573	11.014		21.373				04.757		2,11,0,		293.757	1.5%	291.350	1.7%
61	12.613					0.332						2,5,1,5,	1.50	208.538	1.4%
62	12.755	1.532		1.887	14.9%	0.332		3.102		9.500	8.1%	196.783	3.1%	496.877	1.4%
63	12.823	5.759	6.34	5.288	6.51	0.215		16.504	4.9%	38.811	4.2%	719.275	2.1%	797.896	1.4%
64	12.923	0.700	0.30	1.650	0.54	0.213		0.368	4.74	2.336	12.2%	28.251	6.2%	549.662	2.61
65	13.018	0.700		1.740				0.300		6.273	12.2.	80.831	2.3%	315.852	0.9%
66	13.080			1.740				1.404		2.245		39.202	1.8%	28.007	0.5.
67	13.221	0.125		0.259				2		0.324		3.177	8.8	91.504	4.61
6B	13.433	9.665	98.	10.680	77.	8.966		14.122	64.	24.539	42.	271.748	2.5%	721.762	1.9%
69	13.558	1.448	66.	2.107	35.	0.538		3.984	12.4%	8.413	10.8%	136.039	3.5%	392.228	1.0%
70	13.618	0.989		1.147	61.	0.684		0.853	63.	1.599	40.	22.692	5.5%	167.577	2.1%
71	13.682	1.323		4.070	10.9%			1.577		8.043	8.9%	114.802	4.48	1530.736	1.2%
72	13.765			0.136								3.469	14.0%	34.167	7.0%
73	13.991	0.281		0.250		0.386		0.191		0.386		0.695		36.946	3.5%
74	14.099	*												20.469	2.4%
75	14.201	0.395		1,963				0.899		2.374		16.156	4.6%	445.429	1.0%
76	14.272	0.568		2,169				0.987		4.154	11.5%	74.303	4.8	824.773	2.3%
77	14.500									0.155		3.990	9.3%	22.077	7.6%
78	14.707	1.879		1.848	25.	1.624		2.687	80.	4.341	67.	5.880		25.177	4.2%
79	14.884	0.616		0.603		0.490		0.586		1.873		0.623		9.901	7.1%
80	14.959	0.124		0.303						1.104		1.442		138.849	3.0%
81	15.097	0.225		0.736						1.470		3.137	9.3%	363.256	0.8%
82	15.763	4.645	9.7%	4.743	9.9%	4.349	8.9%	4.597	9.7%	5.264	8.61	5.163	8.9%	122.609	2.5%
*****		*******	*****	******		****				*****		*****		*****	
	Total:	1170.5	2.9%	2794.1	3.0%	4122.7	2.5%	4699.4	2.6%	5916.3	2.1%	7794.9	2.8%	10617.6	2.1%

Retention Time Marker/Surrogate Standard Summary

Compound	Mean RT	RT Dev. Range	RT Crit.	Mean RF	Recovery Range	Surr Crit
tetrachloro-meta-xylene	4.7225	0159 to .0108	Passes	17704.605	76.4 to 107.1%	** Fails *
decachlorobiphenyl	16.4242	0175 to .0114	Passes	17025.305	95.8 to 116.8%	** Fails *

Notes:

- 1) Retention times linearly adjusted to place tetrachloro-meta-xylene at 4.7225 and decachlorobiphenyl at 16.4242.
- 2) Peaks chosen within window of +/- 0.01184 of the mean RT of corresponding peaks in all mixtures.
- 3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.12889.

2865_1127F6

CALIBRATION SUMMARY BACK CALCULATIONS

 Lab ID:
 STL-VT
 Calib date(s):
 27-NOV-00 11:11
 to

 GC:
 HP-2865
 28-NOV-00 00:22

 Col. 1:
 RTX-5

 Col. 2:
 RTX-35
 File:
 49,50 27NOV001002

	50	100	200	400	800	
Standards	ppb	ppb	ppb	ppb	ppb	%RSD
Aroclor 1016	49.3	101.0	201	403	796	
Cal Fact	0.986	1.010	1.005	1.008	0.995	1.0
% Diff	1	-1	-1	-1	1	
Aroclor 1221	49.5	101	200	398	802	
Cal Fact	0.990	1.010	1.000	0.995	1.003	0.8
% Diff	1	-1	0	1	0	
Aroclor 1232	48.0	99.2	197	400	807	
Cal Fact	0.960	0.992	0.985	1.000	1.009	1.9
% Diff	4	1	2	0	-1	
Aroclor 1242	49.3	98.7	203	398	802	
Cal Fact	0.986	0.987	1.015	0.995	1.003	1.2
% Diff	1	1	-2	1	0	
Aroclor 1248	49.3	100	200	400	800	
Cal Fact	0.986	1.000	1.000	1.000	1.000	0.6
% Diff	1	0	0	0	0	
Aroclor 1254	49.7	101	201	398	801	
Cal Fact	0.994	1.010	1.005	0.995	1.001	0.7
% Diff	1	-1	-1	1	0	•
Aroclor 1260	50.0	99.6	203	397	800	
Cal Fact	1.000	0.996	1.015	0.993	1.000	0.9
% Diff	0	0	-2	1	0	
					-	

Cal Fact = Calc. Conc. / Nominal Conc.

%RSD = STD Dev / Mean of Cal Fact

% Diff = (Nominal Amt-Calc Amt) / Nominal Amt*100

Kal294f7

AROCLOR CHECK STANDARD SUMMARY

, ID:	STL-VT	_
GC:	HP2865	Initial Calib. 49,50 27NOV001002
Col. 1:	RTX-5	date/time: 11/27/00 11:11 to
Col. 2:	RTX-35	11/28/00 0:22

Date: 11/28/00

Check Standard File: 49,50 27NOV001641,3

Time: 17:30

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1248	200	197	1.5

Date: 11/28/00

Check Standard File: 49,50 27NOV001641,4 Time: 17:53

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1242	200	201	0.5

Date: 11/28/00

Check Standard File: 49,50 27NOV001641,18 Time: 23:09

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1248	200	205	2.5

Date: 11/28/00

Check Standard File: 49,50 27NOV001641,19 Time: 23:31

Compound	Nominal Amount (ppb)	Calc. Amount (ppb)	% Diff.
AR1254	200	206	3.0

Date: 11/29/00

Check Standard File: 49,50 29NOV001641,33 Time: 4:4

	Nominal	Calc.	
Compound	Amount (ppb)	Amount (ppb)	% Diff.
AR1248	200	209	4.5

Kal294f7

AROCLOR CHECK STANDARD SUMMARY

' ¬b ID: GC:	STL-VT HP2865	 Initial	Calib. 49,50 27I	VOV001002			
Col. 1:	RTX-5	date/time: 11/27/00 11:11					
Col. 2:	RTX-35		0:22				
Check Star	ndard File: <u>49,50 29NOV</u>	001641,34	Date: Time:	11/29/00 5:10			
		Nominal	Calc.				
	Compound	Amount (ppb)	Amount (ppb)	% Diff.			
	AR1260	200	211	5.5			
L.							
heck Star	ndard File:		Date: Time:				
		Nominal	Calc.				
	Compound	Amount (ppb)	Amount (ppb)	% Diff.			
ck Star	ndard File:		Date: Time:				
F			·				
	Compound	Nominal Amount (ppb)	Calc. Amount (ppb)	% Diff.			
	Compound	Amount (ppb)	Amount (ppb)	76 Dill.			
L_ heck Star	ndard File:		Date: Time:				
	Compound	Nominal Amount (ppb)	Calc. Amount (ppb)	% Diff.			
				•			
Check Star	ndard File:		Date: Time:				
F		Nominal	Calc.				
	Compound	Amount (ppb)	Amount (ppb)	% Diff.			
				· -			
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6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120



CHAIN OF CUSTODY RECORD

PROJ. NO	PRO.	ECT NAM	IF	*******								7	, , ,		, ,	,			
PROJ. NO. PROJECT NAME GYS. 69:20) GYS. 69:20) RAMPIERS: (Signature) SAMPIERS: (Signature)									/	\prec /	//		•		·				
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STA NO. DATE TIME & g				STATION LOCATION			7 /	REMARKS											
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10/23/95 5951188L.CDR

Distribution: Original Accompanies

pment; Copy to Coordinator Field Files

SEVERI IREN		CLES LUG-IN	SHEEL - FOR	(/
Lab Name: Severn Trent Laboratories - V				Page of
Received By (Print Name):	cott	Lavie	700	Log-in Date: 11/22 0
Received By (Signature):				
Case Number: 20000		C	ORRESPONDE	NG
Sample Delivery				REMARKS: CONDITION
Group No: KAL294	CLIENT	SAMPLE	ASSIGNED	OF SAMPLE SHIPMENT,
ETR Number: 80737	SAMPLE #	TAG#	LAB#	ETC.
REMARKS:	W74105	NIX	438682	Were air bubbles present
1. Custody Seal Prosent disont*	W74104		438683	in any VOA vials? NIA
Intact Broken	W74/10		438684	Samples received
2. Custody Seal Nos.:	W74108.		438685	Intact, As wore
3. Chain-of-Custody	W74 111		438686	C-Stody Soulson
Records Present Absoni*	W74106		438687	autsive of coolers.
4. Sample Information	W74107		438688	
Sheets Present bsent*	W74112		438689	3
5. Airbill Airbill Sucker	W74113		438690	
Present/Absent*	w74 109		438691	
6. Airbill No.: 823750545900				
7. Sample Tags Present Strent				
Sample Tag				
Numbers Listed Hot Listed				
on Chain-of-Custody)			
8. Sample				
Condition: Intact Broken*				
Leaking				
9. Does information on the custody				
records, sample information sheets,			·	
sample tags and labels agree?				
YSAIO*				•
10. Date Received at Lab: 1/00/00				
11. Time Received: 090C				
12. Cooler Temperature: 3 - 30				
Sample Transfer				
Fraction: All				
Area #: [[[[[[[[[[[[[[[[[[
By: SinL				
On: 11/22/00		5111	11/22/	10
* Contact Project Director				
Reviewed by:			Logbook No.:	
Date:			Logbook Page 1	Vo.:

** COOLER RECEIPT CHECKLIST **

WERE CUSTODY SEALS PRESENT ON THE COOLERS?							
YES	NO						
IF SO, WERE THERI	E CUSTODY SEAL N	UMBERS?					
YES	NO						
LIST THE CUSTODY	SEAL NUMBERS.						
WHAT TYPE OF CO	OLING WAS UTILIZ	ED?					
ICE	MELTED ICE	PACKS	NONE				
COOLER TEMPERA	TURE (degrees c):	<u>3°C</u>					
DATE AND TIME CO	OOLER RECEIVED:	11-22-00	0900				
DO SAMPLES APPEA	AR TO BE INTACT:	YES	NO				
DO ANY SAMPLES HAVE SHORT HOLDING TIMES? (less than seven days)							
WET CHE	EM	YES	NO ·				
EXTRAC	TABLES	YES	NO				
UNPRES	VOA	YES	NO				
RADIATION SCREEN	N RESULTS <0.05 MF	VHR YES	NO				

SEVERN TRENT LABORATORIES -VT

SM.0002.031198

** COOLER RECEIPT CHECKLIST **

WERE CUSTOD	Y SEALS PRESENT	ON THE COOLERS?
-------------	-----------------	-----------------



NO

IF SO, WERE THERE CUSTODY SEAL NUMBERS?

YES



LIST THE CUSTODY SEAL NUMBERS.

WHAT TYPE OF COOLING WAS UTILIZED?



MELTED ICE

PACKS

NONE

COOLER TEMPERATURE (degrees c):

3°C

DATE AND TIME COOLER RECEIVED:

11-22-00

0900

DO SAMPLES APPEAR TO BE INTACT:

YES

NO

DO ANY SAMPLES HAVE SHORT HOLDING TIMES? (less than seven days)

WET CHEM

YES

NO

EXTRACTABLES

YES

NO

UNPRES VOA

YES

NO

RADIATION SCREEN RESULTS < 0.05 MR/HR



NO

1 P

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# KAL323

PCB ANALYSES

A-SITE GROUNDWATER SAMPLING

Analyses performed by:

Severn Trent Laboratories Colchester, Vermont

Review performed by:

BBL BLASLAND, BOUCK & LEE, INC.

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the data package for SDG# KAL323 for the analysis of groundwater samples from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

				Analyses		
Sample ID	Lab ID	Matrix	Sample Date	РСВ	TSS	тос
W74114	441382	water	12/26/00	х		
W74115	441383	water	12/27/00	×		
W74116	441384	water	12/27/00	×		
W741171	441385	water	12/27/00	х .		
W74118	441549	water	12/27/00	×		
W74120	441550	water	12/28/00	×		
W74119	441595	water	12/28/00	×		
W74121	441596	water	12/28/00	×		
W74122	441597	water	12/28/00	х		
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MS/MSD analysis performed on sample.

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by STL (formerly known as Aquatec, Inc.) in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of water samples are 5 days from date of sample receipt to extraction and 40 days from extraction to analysis. The technical holding times are 7 days from sample collection to extraction and 40 days to analysis.

All samples were extracted and analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No Aroclors were detected in the method or rinse blanks.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibrations were within the specified limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All the continuing calibration standards were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

Examination of the chromatograms showed poor pattern matches for Aroclor 1242 in samples W74118, W74119 and W74120. Data for Aroclor 1242 have been qualified as estimated with presumptive evidence of identification based on the poor matches. All other Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. Field Duplicates

Results for field duplicate samples are summarized below:

Sample ID/ Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
W74115 / W74116	Aroclor 1242	0.050J	0.044J	12.8%

The field duplicates result are acceptable.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	<u>X</u>		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Were surrogate recoveries outside of specified limits for any sample or blank?		x	
If yes, were the samples reanalyzed?			<u>X</u>
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
out of			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
0_ out of2_		-	
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X	•	
Do any method/instrument blanks have positive results?		X	
Are there field/rinse blanks associated with every sample?	X		
Do any field/rinse blanks have positive results?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016	X		
Aroclor 1221	X		
Aroclor 1232	X		

PCB Data Review Checklist - Page 2

	YES	NO	NA
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Aroclor 1260	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	x		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	x		
Are %D values for all compounds within limits (15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	X		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
ls both a combined and single column Aroclor Identification Report present for every sample?	x		
Do the combined column and individual column Aroclor identifications agree?	x		
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			Х
Compound Quantitation and Reported Detection Limits			
Are the reporting limits adjusted to reflect sample dilutions, and, for soils, sample moisture?			X
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?	Х		

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time		Surr	ogates	
		TCX-1	TCX-2	DCB-1	DCB-2
W74114					
W74115					
W74116					
W74117					
W74117MS					
W74117MSD					
W74118					
W74120					
W74119					
W74121					
W74122					
					_
		1			

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP2865</u> Column: <u>RTX-5 / RTX-35</u>

Date: Time:	01/07/00	1/8/00	1/8/00	1/8/00	1/8/00			
	01/08/00	8:00	8:23	11:23	11:46			
	Initial Cal.	Cont. Cal.						
	%RSD	%D						
Aroclor 1016	ok							
Arocior 1221	ok							
Arocior 1232	ok							
Aroclor 1242	ok		ok					
Aroclor_1248	ok	ok		ok				
Aroclor 1254	ok				ok			
Aroclor 1260	ok							
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

				·			
							-
<u> </u>		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

CORRECTED ANALYSIS SUMMARY FORMS

				W7411	4
≟ab Name:	STL Burlington		Lab Code:STLVT		
Contract:	20000		Case: 20000	SDG: KAL	.323
Phase Type:	WATER		Lab Sample ID:	441382	AMW-3A
Phase Weight:	970.	(mL)	Date Received:	12/28/00	
Injection Volume:	1.0	(uL)	Date Extracted:	12/29/00	
Dilution Factor:	1.0		Date Analyzed:	01/08/01	
% Solids:			Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2 -	Aroclor-1016	0.052	U
11104-28-2	Aroclor-1221	0.052	υ
11141-16-5	Aroclor-1232	0.052	U
53469-21-9	Aroclor-1242	0.059	
12672-29-6	Aroclor-1248	0.052	U
11097-69-1	Aroclor-1254	0.052	U
11096-82-5	Aroclor-1260	0.052	U

W74115

Lab Name:	STL Burlington		Lab Code: STLVT		
Contract:	20000		Case: 20000	SDG:	KAL323
Phase Type:	WATER		Lab Sample ID:	441383	ANW-10A
Phase Weight:	970.	(mL)	Date Received:	12/28/00	
Injection Volume:	1.0	(uL)	Date Extracted:	12/29/00	
Dilution Factor:	1.0		Date Analyzed:	01/08/01	
% Solids:			Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.052	U	
11104-28-2	Aroclor-1221	0.052	U	
11141-16-5	Aroclor-1232	0.052	U	
53469-21-9	Arocior-1242	0.050	J	
12672-29-6	Aroclor-1248	. 0.052	U	
11097-69-1	Aroclor-1254	0.052	U	
11096-82-5	Aroclor-1260	0.052	U	

EPA SAMPLE NO.

			W74116	
Lab Code:	STLVT			
Case: _	20000	SDG: _	KAL323	
Lab Sample ID:		441384		AMW-ICA
Da	te Received:	12/28/00		DWP.

Injection Volume:	1.0	(uL)	Date Extracted:	12/29/00	
Dilution Factor:	1.0		Date Analyzed:	01/08/01	
% Solids:			Sulfur Clean-up:	N	(Y/N)

(mL)

ab Name: STL Burlington

Contract:

Phase Type:

Phase Weight:

20000

WATER

910.

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER	
12674-11-2	Aroclor-1016	0.055	U	
11104-28-2	Aroclor-1221	0.055	U	
11141-16-5	Aroclor-1232	0.055	U	
53469-21-9	Aroclor-1242	0.044	J	
12672-29-6	Aroclor-1248	0.055	U	
11097-69-1	Aroclor-1254	0.055	U	
1096-82-5	Aroclor-1260	0.055		

				W741	17
Lab Name:	STL Burlington		Lab Code: STLVT		
Contract:	20000		Case: 20000	SDG: KA	L323
Phase Type:	WATER		Lab Sample ID:	441385	- AMW-10B
Phase Weight:	940.	(mL)	Date Received:	12/28/00	- HIMW 109
jection Volume:	1.0	(uL)	Date Extracted:	12/29/00	
Dilution Factor:	1.0		Date Analyzed:	01/08/01	
% Solids:			Sulfur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2 -	Aroclor-1016	0.053	U
11104-28-2	Aroclor-1221	0.053,	U
11141-16-5	Aroclor-1232	0.053	U
53469-21-9	Aroclor-1242	0.053	U
12672-29-6	Aroclor-1248	0.053	U
11097-69-1	Aroclor-1254	0.053	U
11096-82-5	Aroclor-1260	0.053	U

					W74118		
ab Name: STL Burlington		Lab Code: _	STLVT				
Contract:	20000		Case:	20000	SDG:	KAL323	
Phase Type:	WATER		Lab	Sample ID:	441549		AMW-6A
Phase Weight:	960.	(mL)	Dat	e Received:	12/29/00		. ,,,
njection Volume:	1.0	(uL)	Date	e Extracted:	12/30/00		
Dilution Factor:	1.0		Dat	e Analyzed:	01/08/01		
% Solids:			Sulfu	ır Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.052	U
11104-28-2	Aroclor-1221	0.052	U
11141-16-5	Aroclor-1232	0.052	U
53469-21-9	Aroclor-1242	0.049	16 16
12672-29-6	Aroclor-1248	0.052	Ú
11097-69-1	Aroclor-1254	0.052	U
1096-82-5	Aroclor-1260	0.052	U

•						W74119	
ab Name: STL Burlington		Lab Code:	STLVT				
Contract:	20000		Case:	20000	SDG:	KAL323)
Phase Type:	WATER		Lai	b Sample ID:	441595		- AMW-9A
Phase Weight:	985.	(mL)	Da	te Received:	12/30/00		- 1/1/4/00 ///
Injection Volume:	1.0	(uL)	Dal	te Extracted:	12/30/00		
Dilution Factor:	1.0		Da	te Analyzed:	01/08/01		-
% Solids:			Sulf	ur Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.051	U
11104-28-2	Aroclor-1221	0.051	U
11141-16-5	Aroclor-1232	0.051	U
53469-21-9	Arocior-1242	0.18	11
12672-29-6	Aroclor-1248	0.051	U
11097-69-1	Aroclor-1254	0.051	U
11096-82-5	Aroclor-1260	0.051	U

						W74120	
Lab Name: STL Burlington		Lab Code:	STLVT				
Contract:	20000		Case: _	20000	SDG:	KAL323	
Phase Type:	WATER		Lai	o Sample ID:	441550		AMW-4
Phase Weight:	950.	(mL)	Dar	te Received:	12/29/00		. ,,
Injection Volume:	1.0	(uL)	Dat	e Extracted:	12/30/00		
Dilution Factor:	1.0		Dat	te Analyzed:	01/08/01		
% Solids:			Sulfi	ur Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.053	U
11104-28-2	Aroclor-1221	0.053	Ü
11141-16-5	Aroclor-1232	0.053	U
53469-21-9	Aroclor-1242	0.038	N JL
12672-29-6	Aroclor-1248	0.053	Ú
11097-69-1	Aroclor-1254	0.053	Ü
11096-82-5	Aroclor-1260	0.053	U

Date Extracted:

Date Analyzed:

Sulfur Clean-up:

Lab Name: STL Burlington

Contract:

Phase Type:

Phase Weight:

Injection Volume:

Dilution Factor:

% Solids:

20000

WATER 980.

1.0

1.0

(mL)

(uL)

EPA SAMPLE NO.

•			W74121 .	·
Lab Code:	STLVT	L		
Case: _	20000	SDG:	KAL323	
Lai	b Sample ID:	441596		AMW-8A
Da	te Received:	12/30/00)	177 T

12/30/00

01/08/01

N

(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIEF	
12674-11-2 -	Aroclor-1016	0.051	·	
11104-28-2	Aroclor-1221	0.051	U	
11141-16-5	Aroclor-1232	0.051	U	
53469-21-9	Aroclor-1242	0.039	J	
12672-29-6	Aroclor-1248	0.051	U	
11097-69-1	Aroclor-1254	0.051	U	
11096-82-5	Aroclor-1260	0.051	U	

			W74122				
Lab Name:	STL Burlington	<u></u>	Lab Code:	STLVT			
Contract:	20000		Case:	20000	SDG:	KAL323	3
Phase Type:	WATER		Lal	o Sample ID:	441597		- Rince
Phase Weight:	1000.	(mL)	Da	te Received:	12/30/00		- Blank
Injection Volume:	1.0	(uL)	Dat	e Extracted:	12/30/00		- 51000
Dilution Factor:	1.0		Da	te Analyzed:	01/08/01		_
% Solids:			Sulf	ur Clean-up:	N		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2 -	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
11096-82-5	Aroclor-1260	0.050	U

SUPPORTING DOCUMENTATION



STL Burlington 208 South Park Drive Suite 1 Colchester, VT 05446

Tel: 802 655 1203 Fax: 802 655 1248 www.stl-inc.com

January 16, 2001

Ms. Laurie Indick Blasland & Bouck Engineers 6723 Towpath Road Box 66 Syracuse, NY 13214

Re: Laboratory Project No. 20000

Case: 20000; SDG: KAL323

Dear Ms. Indick:

Enclosed are the analytical results of samples received intact by Severn Trent Laboratories on December 28, 29 and 30, 2000. Laboratory numbers have been assigned and designated as follows:

Client <u>Sample ID</u>	Sample <u>Date</u>	Sample <u>Matrix</u>
Received: 12/28/0	00 ETR No: 81154	
W74114	12/26/00	Water
W74115	12/27/00	Water
W74116	12/27/00	Water
W74117	12/27/00	Water
W74117MS	12/27/00	Water
W74117MSD	12/27/00	Water
Received: 12/29/0	00 ETR No: 81180	ı
W74118	12/27/00	Water
W74120	12/28/00	Water
Received: 12/30/0	00 ETR No: 81187	
W74119	12/28/00	Water
W74121	12/28/00	Water
W74122	12/28/00	Water
	Sample ID Received: 12/28/0 W74114 W74115 W74116 W74117 W74117MS W74117MSD Received: 12/29/0 W74118 W74120 Received: 12/30/0 W74119 W74121	Sample ID Date Received: 12/28/00 ETR No: 81154 W74114 12/26/00 W74115 12/27/00 W74116 12/27/00 W74117 12/27/00 W74117MS 12/27/00 W74117MSD 12/27/00 Received: 12/29/00 ETR No: 81180 W74118 12/27/00 W74120 12/28/00 W74119 12/28/00 W74121 12/28/00

The PCB Aroclor analyses of samples W74118 and W74120 exhibited the presence of PCB peaks that did not exactly resemble the pattern of peaks in the laboratories calibration standards. These peaks have been quantified and reported as Aroclor 1242.

If there are any questions regarding this submittal, please contact James Madison at (802) 655-1203.



STL Burlington

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I certify that this package is in compliance with the NELAC requirements, both technically and for completeness, for other than the conditions detailed above. The release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Sincerely,

Christopher A. Ouellette Laboratory Director

CAO/mpg Enclosure

FORM 2 AROCLOR SURROGATE RECOVERY

.ab Name:	STL Burlington	Contract:	20000	
de:	STLVT	Case:	20000	_
SAS No:		SDG:	KAL323	_

EPA	TCX 1	TCX 2	DCB 1	DCB 2	
SAMPLE NO.	% REC #	% REC #	% REC #	% REC #	
PBLKN8	77	78	101	- 101	
PLCSN8	75	74	93	93	
PBLK03	87	88	101	102	
PLCSO3	84	85	96	97	
W74114	82	83	86	87	
W74115	81	83	94	95	
W74116	82	83	91	91	
W74117	81	83	93	94	
W74117MS	82	82	93	94	
W74117MSD	82	82	93	93	
W74118	88	89	94	96	
W74120	77	78	94	95	
W74119	91	93	85	87	
W74121	96	99	101	103	
W74122	90	92	99	103	

Project Specific QC Limits

(60 - 150)

(60 - 150)

TCX = Tetrachloro-meta-Xylene DCB = Decachlorobiphenyl

Column to be used to flag recovery values Values outside of QC limits

D - Surrogates calculated using diluted analysis

A - Extracted surrogates diluted out, surrogates added to diluted extract as retention time markers.

FORM 3 **AROCLOR MATRIX SPIKE RECOVERY**

Lab Name:	STL Burlington	·	Contract:	20000	
iode:	STLVT		Case:	20000	
SAS No:		· 	SDG:	KAL323	
EPA SAMPL	E NO.:	W74117			

Compound	SPIKE ADDED ug/L	SAMPLE CONCENTRATION ug/L	MS CONCENTATION ug/L	MS % - REC #	QC LIMITS REC.
Aroclor 1242	0.53	0	0.51	96	39-150
Aroclor_1254	0.53	0	0.51	96	29-131

- Column used to flag recovery and RPD values with an asterisk * - Values outside of QC limits.

Spike Recovery: 0 out of 2 outside limits.

Comments:

FORM 3 AROCLOR MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:	STL Burlington		Contract:	20000
Code:	STLVT		Case:	20000
SAS No:			SDG: _	KAL323
EPA SAMPI	LE NO.:	W74117		

Compound	SPIKE ADDED ug/L	MSD CONCENTRATION ug/L	MSD % REC #	RPD #	QC LIMITS RPD	QC LIMITS REC.
Aroclor 1242	0.53	0.49	92	4	30	39-150
Aroclor 1254	0.53	0.49	92	4	30	29-131

- Column used to flag recovery and RPD values with an asterisk
* - Values outside of QC limits.

RPD:		0	out of	2	outside limits
Spike Recovery:	0		out of	2	outside limits

Comments:

AROCLOR MATRIX SPIKE BLANK RECOVERY

Lab Name: 🙎	STL Burlington		Contract:	20000	
ode:	STLVT		Case:	20000	
SAS No:			SDG: _	KAL323	
EPA SAMPL	E NO.:	PLCSN8			

Compound	SPIKE ADDED ug/L	MSB CONCENTRATION ug/L	MSB % REC #	LIMITS REC.
Aroclor 1242	0.50	0.43	86	39-150
Aroclor 1254	0.50	0.46	92	29-131

- Column used to flag recovery and RPD values with an asterisk * - Values outside of QC limits.

Spike Recovery: 0 out of 2 outside limits.

nments:

AROCLOR MATRIX SPIKE BLANK RECOVERY

Lab Name:	STL Burlington	-	Contract:	20000	
∌ode:	STLVT		Case:	20000	
SAS No:		Annual System	SDG:	KAL323	
EPA SAMP	PLE NO.:	PLCSO3			

Compound	SPIKE ADDED ug/L	MSB CONCENTRATION ug/L	MSB % REC #	QC LIMITS REC.
Aroclor 1242	0.50	0.45	90	39-150
Aroclor_1254	0.50	0.47	94	29-131

- Column used to flag recovery and RPD values with an asterisk * - Values outside of QC limits.

Spike Recovery: 0 out of 2 outside limits.

omments:

FORM 4 AROCLOR METHOD BLANK SUMMARY

Lab Name:	STL Burlington	Contract:	20000
Code:	STLVT		20000
ab Sample ID:	PBLKN8	SDG:	KAL323
Matrix:	WATER	-	LOW
ate Extracted:	12/29/00	Level: _	
Analyzed(1):	01/08/01	Date Analyzed(2):	01/08/01
Analyzed(1):	03:30	Time Analyzed(2):	03:30
GC ID(1):	HP2865	GC ID(2):	HP2865
GC Column(1):	RTX-5	GC Column(2):	RTX-35

LAB ID	CLIENT ID	DATE ANALYZED 1	DATE ANALYZED 2
PLCSN8	PLCSN8	01/08/01	01/08/01
441382	W74114	01/08/01	01/08/01
441383	W74115	01/08/01	01/08/01
441384	W74116	01/08/01	01/08/01
441385	W74117	01/08/01	01/08/01
441385MS	W74117MS	01/08/01	01/08/01
441385MD	W74117MSD	01/08/01	01/08/01

7					•	PBLKN8
Lab Name:	STL Burlington		Lab Code:	STLVT		
Contract:	20000		Case: _	20000	SDG:	KAL323
Phase Type:	WATER		Lal	b Sample ID:	PBLKN8	
Phase Weight:	1000.	(mL)	Da	te Received:		
njection Volume:	1.0	(uL)	Dat	te Extracted:	12/29/00	
Dilution Factor:	1.0		Da	te Analyzed:	01/08/01	
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
11096-82-5	Aroclor-1260	0.050	U

FORM 4 AROCLOR METHOD BLANK SUMMARY

' '> Name:	STL Burlington	Contract:	20000
J Code:	STLVT		20000
ab Sample ID:	PBLKO3	Spg:	KAL323
Matrix:	WATER	-	LOW
ate Extracted:	12/30/00	Level:	
Analyzed(1):	01/08/01	Date Analyzed(2):	01/08/01
Analyzed(1):	04:15	Time Analyzed(2):	04:15
GC ID(1):	HP2865	GC ID(2):	HP2865
SC Column(1):	RTX-5	GC Column(2):	RTX-35
			···

LAB ID	CLIENT ID	DATE ANALYZED 1	DATE ANALYZED 2
PLCSO3	PLCSO3	01/08/01	01/08/01
441549	W74118	01/08/01	01/08/01
441550	W74120	01/08/01	01/08/01
441595	W74119	01/08/01	01/08/01
441596	W74121	01/08/01	01/08/01
441597	W74122	01/08/01	01/08/01

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

			•			PBLKO3	
ab Name: S	TL Burlington	 	Lab Code: _	STLVT			
Contract: _	20000		Case: _	20000	SDG:	KAL323	
Phase Type:	WATER		Lai	o Sample ID:	PBLKO3	3	
Phase Weight:	1000.	(mL)	Da	te Received:			
Injection Volume:	1.0	(uL)	Dat	e Extracted:	12/30/00		
Dilution Factor:	1.3		Da	te Analyzed:	01/08/01		
% Solids:			Sulf	ur Clean-up:	N	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/L	QUALIFIER
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Arocior-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
1096-82-5	Aroclor-1260	. 0.050	U

JLB - HP2865

roclor Calibration Summary
ibration of 7-Jan-2001 13:58 through 8-Jan-2001 03:07.

)1:[8080] 49,50 07JAN011250

THOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

Peak #	RT	Aroclor	1221		1000								1254	Aroclor	1260
PEAK H	3.284	69.691	2.18	Aroclor	1.5	Aroclor 1.179		Aroclor		Aroclor	1248	Aroclor	1254		1260
2	3.711		11.48	40.247 11.633			16.	1.267	21.	0.142		0.775		0.282	
3	4.196	88.884	3.78	60.683	23. 2.8%	2.590 24.419	c na	2.696	4 03	2.328		2.732		2.023	
4	4.288	00.004	3.74	00.083	2.84	24.419	6.8	22.241	4.81	2.299					
5	4.317	67.128	2.4%	52.120	1.5%	33.192	5.0%	29.766	3.8%	8.254	6.1	8.307	8.21	8.358	13.1
ĕ	4.386	231.146	0.6%	196.501	1.9%	163.081	2.21	139.356	1.3%	13.757	4.1%	2.199		1.573	
ž	4.857	13.886	4.1%	130.301	1.50	103.001	2.21	139.330	1.34	13.757	4.14	2.732		0.805	
ė	4.911	34.477	7.20	109.697	10.55	244.590	4.11	198.226	2.4%	106.470	2.0%	3.701	7.4%	2.099	
ğ	5.042		10.7%	13.527	5.0	30.770	6.01	24.920	6.31	5.384	10.6	0.342	7.44	0.217	
10	5.162	12.551	4.31	92.017	1.48	217.164	1.7%		1.6%						
11	5.277	5.729	6.01	6.384	9.9%	7.351	8.6%	174.423		72.882	2.8%	2.741	7.7%	1.561	
12	5.391		38.	22.980	8.9%	52.492	1.8	7.450 42.109	3.8% 3.4%	6.186 15.071	17.	6.300	19.	6.477	6.71
13	5.529	24.014	4.78	203.235	2.8%	503.738	2.5%	392.464			9.78	2.617	5 19	1.869	
14	5.694	15.512	4.5%	105.655	1.9%	253.060	1.61	200.117	2.7 % 2.1 %	240.441	3.21	7.427	5.1%	3.420	8.71
15	5.813	7.939	4.1	63.388	4.78	158.539	5.41	123.899	6.2%	97.854	1.8	5.816	12.71	1.851	
16	5.905	0.493	7.10	16.654	4.18	47.351	2.81	37.618	2.7%	62.561 48.174	5.8%	1.916	18.	1.138	14.0%
17	6.074	4.977	4.5%	55.367	1.98	144.030	3.31	118.912	2.4%	227.123	2.8% 3.5%	1.283 176.401	7.6% 4.0%	0.311	4 04
18	6.147		45.	54.920	6.98	142.241	3.21	115.041	3.4%	185.485	3.21	51.507		10.600	4.8%
19	6.208	1.350		34.986	0.5%	94.997	2.0%	76.495	0.6%			51.507	7.5%	2.878	55.
20	6.443	3.891	7.11	70.642	1.38	184.443	1.48	152.404	0.7%	113.058	2.31	100 070		1.247	
21	6.502	3.705	9.01	48.979	2.01	101.265	1.81	100.004	1.1%	273.397 117.327	1.61	102.072	1.28	1.997 0.845	10.6%
. 22	6.664	2.725	7.01	70.280	1.91	163.525	2.41	156.348	2.0	257.429	1.7%	37.366	1.8%		10.31
. 23	6.831	0.542		18.446	4.9%	33.821	4.61	40.336	3.9%	64.738		6.213	6.01	1.608	10.38
24	6.893	0.5.2		3.132	4.54	33.021	4.01	6.873	6.9%	54.738	3.31	6.213	6.04	0.306	
25	7.006	0.111		2.768	7.5%	1.800	16.	6.602	8.2%	11.236	8.2%	1.429	4.61		
26	7.079	1.465	7.9%	35.946	3.1%	14.913	2.6%	81.382	3.21	142.416	3.21	32.567	2.41	0.669	
27	7.157	3.911	6.21	66.199	1.5%	23.374	4.18	145.691	1.5	283.711	1.81	137.562	0.7%	1.822	
28	7.247	5.829	4.61	66.251	2.21	19.295	2.71	144.975	2.4%	257.391	2.5%	286.893	3.7%	122.721	
29	7.389	0.575		4.257	~	2.594	2.7.	11.286	6.91	31.567	3.91	47.368	1.19	0.483	
30	7.588	3.377	8.71	64.351	3.8%	5.525	3.9%	144.360	5.11	256.776	5.31	93.535	0.9%	19.761	4.75
31	7.705	7.710	4.78	21.418	2.7%	3.851	4.5%	54.466	0.9	152.727	2.21	447.366	4.38	156.031	2.01
32	7.816	2.066		9.217		0.700		25.747	3.11	71.404	1.61	147.711	2.51	1.965	.,
33	7.954			0.396		• • • • • • • • • • • • • • • • • • • •		1.150	3.1.	3.606	13.41	5.615	4.31		
34	8.073	0.339		1.523		0.147		4.092	6.5%	12.118	5.31	23.455	2.19	0.579	
35	8.186	1.760	3.81	7.583	3.7%	0.341		20.551	2.91	59.240	2.1%	128.996	1.5%	5.103	8.51
36	8.305	3.402	6.3%	12.259	3.3%	0.461		33.478	3.81	95.188	2.8	262.227	1.2%	27.192	5.1
37	8.401	1.020		6.970	4.5%	0.241		19.853	5.11	57.077	3.3%	79.194	1.7%		
38	8.487									2,	2.5			65.640	1.3%
39	8.531	6.680	6.8	21.635	3.5%	0.641		56.791	2.61	163.087	2.01	507.104	0.7%	88.727	3.01
40	8.806	1.296		6.263	5.91	0.156		15.572	5.3%	46.937	4.0%	94.565	0.91	168.811	2.01
- 41	8.912	0.737		1.033				2.509	6.61	7.482	7.4%	61.240	1.24	103.809	2.41
42	9.002	0.250		0.991	11.9%			2.993	7.7%	8.659	7.5%	28.740	3.71		
43	9.111	4.438	4.1%	12.143	2.1%	0.406		35.015	2.1	95.525	2.41	360.713	1.8%		

¹⁾ Retention times linearly adjusted to place tetrachloro-meta-xylene at 3.9384 and decachlorobiphenyl at 14.3168.

²⁾ Peaks chosen within window of +/- 0.01759 of the mean RT of corresponding peaks in all mixtures.

³⁾ Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT^ 1.11278.

JLB - HP2865

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THOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

						-									
Peak #	RT	Aroclor	1221	Aroclor	1232	Aroclor	1016	Aroclor	1242	Aroclor	1248	Aroclor	1254	Aroclor	1260
44	9.361	0.242										26.490	2.78	26.130	4.6
45	9.397			0.688				2.135		6.114	12.0%				
46	9.463			0.338		0.090		1.072		3.210		11.318	6.11		
47	9.516	0.267		0.336				0.763		2.426		37.095	1.91	62.763	3.21
48	9.661	2.229	8.2%	2.218	5.2%			3.999	7.3%	10.638	5.5%	189.326	3.6%	426.918	3.1%
49	9.791	5.964	93.	13.678		3.514		32.368	6.61	103.015	28.	277.445	13.7%	158.233	5.31
50	10.000	0.529		0.708				1.210	0.00	4.221	10.21	63.195	1.61	173.573	5.41
51	10.065			0.265							20.20	03.275		95.611	2.31
52	10.178	0.153		0.105	•			0.738		2.080		27.950	3.6%	1.281	
53	10.253			•				0.807		2.120		29.586	1.9%	46.684	4.1%
54	10.390	3.273	3.91	3.061	11.2%			8.499	3.1%	20.907	2.61	361.150	0.3%	465.068	3.31
55	10.611	0.295		0.296				0.884	•	2.598	7.29	30.371	3.1%	56.310	3.21
56	10.746													11.394	10.0%
57	10.825	0.574	60.	0.932	37.	0.323		0.143		1.359		13.250	2.4	262.328	2.9%
. 58	10.957									0.882		12.461	17.	142.301	3.0%
59	11.139	1.166	79.	0.883	38.	0.478		3.382	18.	7.262	5.7%	111.753	0.9%	43.193	4.41
60	11.244			0.085						0.168		2.148		42.903	6.3%
61	11.443	0.340		0.810				0.171		1.300		21.408	3.4%	306.799	2.5%
62	11.568	0.309		0.482				0.166		0.798		13.348	2.91	170.369	2.61
63	11.673	0.312		0.477				1.585		3.293	7.4%	63.544	3.3%	112.934	4.21
64	11.798							0.346		0.686		12.801	5.7%	26.888	6.21
65	11.885											5.165		56.614	5.1%
66	12.010	0.677		1.991	3.5%			0.588		3.688	6.2	49.299	1.6%	744.097	3.4%
67	12.138									0.075		1.579		14.981	8.21
68	12.252											0.596		22.404	4.5%
69	12.550	0.441		1.275				0.559		2.333	7.1%	50.899	3.4%	438.455	5.4%
70	12.677	0.154		0.318						0.689		1.960		174.825	3.2
71	12.759	0.109		0.293						0.734		1.871		199.631	4.6
72	12.977											1.936		12.053	7.6%
73	13.207											1.242		92.706	4.7%
74	13.286	0.196		0.262		0.209		0.219		0.222		0.284		6.814	11.5%
75	13.463	0.147		0.413						0.865		1.963		225.589	4.78
76	13.529													14.607	6.1
77	13.926	3.389	11.2%	3.175	9.9%	2.872		3.354	6.9%	3.973	7.8%	3.573	4.4	79.754	4.0
*****		******	*****	*****	*****	*======						******			*****
	Total:	687.6	2.8%	1725.8	3.5%	2685.8	2.9%	3032.5	2.7%	3862.2	2.8	4593.7	2.91	5529.0	3.6%

Retention Time Marker/Surrogate Standard Summary

Compound	Mean RT	RT Dev. Range	RT Crit.	Mean RF	Recovery Range	Surr Crit
tetrachloro-meta-xylene	3.9384	0140 to .0083	Passes	9880.099	79.2 to 110.9%	** Fails *
decachlorobiphenyl	14.3168	0145 to .0099	Passes	10774.761	93.2 to 120.8%	** Fails *

- 1) Retention times linearly adjusted to place tetrachloro meta-xylene at 3.9384 and decachlorobiphenyl at 14.3168.
 2) Peaks chosen within window of +/- 0.01759 of the mean RT of corresponding peaks in all mixtures.
- 3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.11278.

JLB - HP2865

Aroclor Calibration Summary
Calibration of 7-Jan-2001 13:58 through 8-Jan-2001 03:07.

MCD1: [8080] 49,50 07JAN011250

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

Peak #	RT	Aroclor		Aroclor		Aroclor		Aroclor		Aroclor		Aroclor		Aroclor	
1	3.232	2.987	5.5	3.107	6.2%	2.951	5.3	3.071	4.7%	3.226	5.21	3.261	4.51	3.336	8.0%
2 3	4.184 5.076	87.628	3.6	51.002	2.4%	2.472		2.116				į			
4	5.260	24.812	3.5	21.554	3.71	15.679	5.2	14.079	8.0%	1.325		}			
5	5.497	110.456	3.1%	78.847	3.1%	36.226	4.4%	34.123	4.4%	11.315	5.9%	9.739	4.5%	10.264	6.7%
6	5.604	75.276	1.6%	58.322	2.41	36.081	4.3%	32.159	3.1%	2.280	12.6%	0.339		0.338	
7	5.679	246.692 35.867	4.61	216.610	5.7%	185.364	5.9%	161.124	6.2	23.357	39.	9.937		9.599	87.
8	6.149	1.983	2.9%	24.359	4.1%										
9	6.234	14.818	65. 4.6₹	9.179 8.450		20.192	3.6	16.460	2.2%	5.079	8.9%	0.849	85.	0.636	
10	6.366	44.129	1.18	157.951	7.8%	2.468	10.9%	2.302		1.292		1.738		1.218	
11	6.575	1.928	5.4%	10.677	4.4%	335.625	4.7%	274.959	3.51	134.849	3.4%	5.584		3.332	
12	6.772	5.321	3.44	43.957	4.5%	24.632	5.0%	20.176	5.1	5.412	5.1%	0.300		0.191	
13	6.896	9.609		62.610	4.5%	105.503	3.3%	85.171	3.4%	41.108	6.0%				
14	6.988	3.527	6.21	14.492	1.5%	143.194	1.6	116.783	0.7%	43.603	2.4%	2.196		1.395	
15	7.161	24.679	4.1%	209.165	5.71	32.326	5.0	26.176	5.4%	4.396		0.342		0.205	
16	7.479	13.305	4.5%	96.749	3.01	512.561	3.1	403.749	3.41	247.670	3.2%	7.881	5.8	3.613	
17	7.580	13.305	4.54	10.851	1.4%	228.506	1.6%	183.181	1.4%	87.213	2.7%	2.886	6.9%	1.650	9.9%
18	7.675			3.794	4.9% 6.1%	29.327 10.841	3.7% 5.8%	23.954 8.700	3.4 % 6.0%	34.788 11.806	3.2%	3.036	10.2%	0.192	
19	7.748	8.306	5.0%	66.651	4.8%	163.748	5.9%	130.325			5.9%	0.306			
20	7.894	4.679	3.01	52.293	0.8%	134.794	2.9%		6.01	64.299	5.8%	1.846	9.3%	1.073	
21	7.995	3.184		57.302	3.5%			112.420	2.11	217.826	3.8%	171.863	4.3%	10.114	
22	8.050	3.103		24.200	2.0%	149.091 65.715	2.5%	121.881	2.2%	193.599	2.9%	48.337	4.5		
23	8.122	0.935		22.610	1.6%		1.9%	53.217	1.5%	86.526	2.0%	2 200		0.989	
24	8.227	0.163		5.527		62.108	1.5%	50.373	1.11	70.999	2.01	3.309	8.0%	0.586	
25	8.596	6.085	6.3%	82.429	8.8%	15.184	9.1	12.628	6.5	17.872	6.3%	0.492		0.119	
26	8.683	1.615	35.	29.962	1.2% 3.7%	193.942	1.7	173.755	0.7	278.658	2.3%	100.555	0.61	2.619	
27	8.843	0.788	35.	24.155	4.3%	73.119 56.169	2.6	63.591	1.1%	95.778 88.558	2.2	7.966	16.	1.303	
28	8.902	2.026	3.8%	49.686			3.7	52.246	2.91		2.41	6.722	2 (1	0.442	20
29	8.987	0.566	3.01	17.589	3.2%	107.743 40.813	3.6%	110.998 39.213	3.1 % 4.6 %	193.309 49.825	2.9 % 3.7 %	33.788	2.61	0.994 0.371	20.
30	9.127	0.566		3.172	- 3.3₹	1.327	4.2*	7.231	12.8%	12.217	5.01	1 255		0.371	
31	9.216	1.602		37.092	2.7%	14.275	4 38	82.897	2.7%	146.083		1.355 32.910	2 54	0.834	
32	9.338	1.602		37.032	2.74	40.196	4.31	82.897	2.74	146.083	2.61	32.910	2.5	0.834	
33	9.361	4.306	3.5%	73.741	1.4%	40.196	2.84	161.492	1.48	310.559	1.9%	143.190	1.1%	2.303	13.5%
34	9.499	2.785	7.0%	67.009	2.18	16.819	3.0%	145.727	2.5%	258.524	2.5%	44.496	2.6%	1.647	14.38
35	9.648	4.237	6.91	10.846	5.2%	11.260	3.51	27.512	3.9%	82.874	2.24	255.888	3.8%	113.890	1.38
36	9.772	0.834	0.31	2.175	17.	0.364	3.34	6.040	B.2%	18.917	4.78	68.170	1.8%	17.640	7.6%
37	9.850	0.825		5.741	5.21	3.109	13.8%	14.222	5.1%	31.861	3.34	44.958	1.6%	17.040	7.01
38	9.940	5.397	5.2%	12.442	2.91	1.465	13.04	32.245	2.3%	92.533		332.734	4.49	147.249	1.8%
39	10.115	2.307	22.	9.183	2.94					70.056	2.3% 2.0%	144.220	2.61	1.740	28.
40	10.176	2.347	9.11	65.920	3.3%	1.045		25.325	2.0%			144.220	2.01		20.
41	10.283	2.347	9.14	65.920	3.3	5.088	11.2	147.171	4.71	257.643	5.81	F 200	3.6	1.282	
	10.265	1.727								4.390	6.61	5.289			
42 43	10.465			6.950	4.3%	2.164		18.389	4.01	54.349	2.9%	108.933	1.6%	6.043	6.3
44	10.830	0.376		1.466	14.9%	0.176		3.870	3.61	11.310	4.0%	22.961	2.0%	0.579	7 10
45		1.699	26	7.759	3.9%	0.321	•	21.180	3.61	61.825	2.7%	129.296	1.7%	5.170	7.1%
40	10.994	3.682	45.	10.755	6.3%	1.227	94.	28.089	2.21	82.243	3.3%	241.250	1.5%	27.410	4.31

- 1) Retention times linearly adjusted to place tetrachloro-meta-xylene at 4.6749 and decachlorobiphenyl at 16.3345.
 2) Peaks chosen within window of +/- 0.01759 of the mean RT of corresponding peaks in all mixtures.
- 3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE = HEIGHT 1.09489.

MIUCIUI Caliulatiun Summary

Calibration of 7-Jan-2001 13:58 through 8-Jan-2001 03:07.

MCD1: [8080] 49,50 07JAN011250

METHOD: 8080_PCB:AN

Peak Response Factors and Relative Deviations

Peak #	22					31	1016	N1	1242	Aroclor	1240	Aroclor	1254	Aroclor	1260
46	RT 11.155	Aroclor 0.941	1221	Aroclor 6.768	6.1%	Aroclor 0.230	1016	19.460	5.21	56.923	3.98	78.844	2.28	0.521	
47	11.287	6.807	5.9%	19.947	4.34	0.230			2.8%	166.066	2.7%	540.247	0.8%	*****	
48	11.340	0.807	3.34	19.947	4.34	0.638		54.050	2.81	166.066	2.75	540.247	0.64	180.657	1.78
49	11.408	0.677		0.783				2.176	12.08	6.992	10.3%	48.967	1.3%	71.590	2.1%
50	11.517	0.543		0.763				2.176	12.04	0.992	10.34	36.480	2.48	73.279	2.91
51	11.560	0.543		0.913				2 162	12.45	0.560	10.08	31.254	2.45	13.213	2.5
52	11.682	3.840	8.0%		2 74	0 370		3.162		9.562		373.843	0.7%		
53	11.739		8.04	13.228	3.7%	0.379		40.782	2.9%	112.998	2.6%			430 760	3.2%
54	11.771	3.151		7.712	·	0.637		10 050	2 04	FC 807	2 28	213.391	3.2	430.760	3.28
55	11.889	0.330		0.301	7.1%	0.627		19.050	3.2	56.887	3.3%	43 605	1.9%	76.238	3.0%
56	12.031	3.174	40		14 04			0.725		2.360	9.41	43.695	3.5%	526.048	3.21
57	12.162	0.997	40.		14.0%	1.236		6.423	4.9%	16.895	5.2%	238.836		4.725	4.2
58	12.162			0.866		1.618		1.599	44.	3.772	5.9%	12.124	0.8		5.2%
59	12.472	1.411		1.268				1.909		5.345	7.0	84.018	2.2	232.520	3.24
60	12.472	10.573		21.500		8.660		45.369	10.3	143.649	33.	256.479	28.	103.626	1.9%
61	12.512									•		198.929		192.592	
62	.12.550	8.090		9.707		4.540		14.998				50.997		138.395	3.0%
63	12.766	1.341	0.04	1.514				2.291	6.1%	6.959	6.3%	135.103	1.7%	334.840	3.2% 3.0%
64	12.866	4.319	8.2	3.633	2.81	1.299		11.461	5.1	27.218	4.71	488.064	0.9%	544.268	
		0.544		1.092				0.287		1.730		18.668	6.4	362.188	2.81
65 66	12.961			1.332				1.514		4.170		54.511	2.6	211.795	3.1
	13.025							0.989		1.670		28.441	3.5	20.323	
67	13.166	2 216								0.135		2.043	0.08	61.966	6.6 % 2.5 %
68	13.380	3.816	77.	4.620	90.	2.704		6.538	37.	13.846	27.	179.871	0.9%	468.771	
69	13.507	0.446		0.976				2.582		5.763	7.6%	96.890	2.1	257.580	2.2% 4.3%
70 71	13.565			0.381								15.330	5.3	112.618	3.1%
	13.632	0.883		2.684				1.082		5.619	8.8	81.125	2.4	1034.487	5.0%
72 73	13.937 14.045	0.829		2.857				1.792				0.539		25.439 14.813	6.28
74		3.459						6.021			20	0.342	12.5%	311.012	3.5%
75	14.146 14.216	1.308		2.086		2.154		1.156		2.283	30.	12.670 51.507	3.6	565.599	4.48
76	14.216	0.428		1.531	37.			0.758		2.905		3.264	3.61	17.060	9.0%
													75.	18.606	7.8%
77	14.644	7.713		4.304		10.133		3.156		4.904	32.	2.272	15.	7.537	11.9%
78	14.819	0.653		0.794		24.376		0.880		1.283		0.755		97.510	5.6%
79	14.893	0.000		0.730						0.589		1.305		260.003	4.28
80	15.030	0.262		0.774						1.092		2.377	2 05	85.284	5.9%
81	15.685	3.035	9.2%	3.034	5.1%	2.650		3.111		3.511	6.71	3.488	3.8%	00.204 #######	J. J.
	Total	*****		1046.0		2044 5		2202 (3 51	######################################	3.0%	5385.6	2.31	7223.0	3.3%
	Total:	833.1	5.1%	1946.9	4.0%	2946.5	3.7%	3303.6	3.5,₹	4176.5	3.04	9,69.6	4.34	1223.0	٠. ٠

Retention Time Marker/Surrogate Standard Summary

Compound	Mean RT	RT Dev. Range	RT Crit.	Mean RF	Recovery Range	Surr Crit
tetrachloro-meta-xylene	4.6749	0149 to .0184	Passes	11460.317	· 77.3 to 111.6%	** Fails *
decachlorobiphenyl	16.3345	0167 to .0211	Passes	10730.244	91.8 to 124.9%	** Fails *

- 1) Retention times linearly adjusted to place tetrachloro-meta-xylene at 4.6749 and decachlorobiphenyl at 16.3345.
- 2) Peaks chosen within window of +/- 0.01759 of the mean RT of corresponding peaks in all mixtures.
- 3) Quantitation is based on HEIGHTS; instrument response is linearized by RESPONSE HEIGHT 1.09489.

2865_010701F6

CALIBRATION SUMMARY BACK CALCULATIONS

Lab ID:	STL-VT	Calib	date(s): 07 -JAN-01 13:58	to
GC:	HP2865		08-JAN-01 03:07	
Col. 1:	RTX-5			
Col. 2:	RTX-35	File:	49,50 07JAN011250	

	50	100	200	400	800	
Standards	ppb	ppb	ppb	ppb	ppb .	%RSD
Aroclor 1016	47.8	98.8	198	409	798	†
Cal Fact	0.956	0.988	0.990	1.023	0.998	2.4
% Diff	4	1	1	-2	0	
Aroclor 1221	52.7	103	202	397	796	1
Cal Fact,	1.054	1.030	1.010	0.993	0.995	2.5
% Diff	-5	-3	-1	1	1	
Aroclor 1232	52.0	103	200	392	805	
Cal Fact	1.040	1.030	1.000	0.980	1.006	2.4
% Diff	-4	-3	0	2	-1	
Aroclor 1242	48.4	98.0	198	396	810	!
Cal Fact	0.968	0.980	0.990	0.990	1.013	1.7
% Diff	3	2	1	1	-1	1
Aroclor 1248	49.7	95	199	406	800	
Cal Fact	0.994	0.951	0.995	1.015	1.000	2.4
% Diff	1	5	11	-2	0	
Aroclor 1254	51.5	106	202	402	790	
Cal Fact	1.030	1.060	1.010	1.005	0.988	
% Diff	-3	-6	-1	-1	1	
Aroclor 1260	49.5	101	199	385	816	
Cal Fact	0.990	1.010	0.995	0.963	1.020	2.2
% Diff	1	-1	1	4	-2	

Cal Fact = Calc. Conc. / Nominal Conc.

%RSD = STD Dev / Mean of Cal Fact

% Diff = (Nominal Amt-Calc Amt) / Nominal Amt*100

Kal323f7

AROCLOR CHECK STANDARD SUMMARY

`D:	STL-VT				
ಆC:	HP2865			9,50 07J	
ol. 1:	RTX-5	date	e/time: _	1/7/01	13:58
ol. 2:	RTX-35		_	1/8/01	3:07
				Date: Time:	1/8/01
eck Standa	ard File: 49,50 07JAN0	11329,13		8:00	
	·	Nominal	Cal	. !	
	Compound	Amount (ppb)			% Diff.
	AR1248	200		17	8.5
				Date:	1/8/01
eck Standa	ard_File: 49,50 07JAN0	11329,14		Time:	8:23
	٠	Nominal	Cal		0/ D:65
1	Compound	Amount (ppb)	Amour	it (ppb)	% Diff.
	A D4040	200	2	10	- 0
	AR1242	200	2	10	5.0
	AR1242	200	2	10	5.0
1			2	Date:	1/8/01
eck Standa	AR1242 ard File: 49,50 07JAN0		2		
eck Standa		11329,22		Date: Time:	1/8/01
eck Standa	ard File: 49,50 07JAN0	11329,22 Nominal	Calo	Date: Time:	1/8/01 11:23
eck Standa	ard File: 49,50 07JAN0 Compound	11329,22 Nominal Amount (ppb)	Cald Amour	Date: Time:	1/8/01 11:23 % Diff.
eck Standa	ard File: 49,50 07JAN0	11329,22 Nominal	Calo	Date: Time:	1/8/01 11:23
eck Standa	ard File: 49,50 07JAN0 Compound	11329,22 Nominal Amount (ppb)	Cald Amour	Date: Time:	1/8/01 11:23 % Diff. 0.0
	Compound AR1248	11329,22 Nominal Amount (ppb) 200	Cald Amour	Date: Time: c. at (ppb) Date:	1/8/01 11:23 % Diff. 0.0
	ard File: 49,50 07JAN0 Compound	11329,22 Nominal Amount (ppb) 200	Cald Amour	Date: Time:	1/8/01 11:23 % Diff. 0.0
	Compound AR1248	11329,22 Nominal Amount (ppb) 200	Cald Amour	Date: Time: ot (ppb) 00 Date: Time:	1/8/01 11:23 % Diff. 0.0
	Compound AR1248 AR16: 49,50 07JAN0 Compound	Nominal Amount (ppb) 200 11329,23 Nominal Amount (ppb)	Cald Amour 20 Cald Amour	Date: Time: ot (ppb) Date: Time:	1/8/01 11:23 % Diff. 0.0 1/8/01 11:46
	Compound AR1248 ard File: 49,50 07JAN0	11329,22	Calc Amour 20	Date: Time: ot (ppb) Date: Time:	1/8/01 11:23 % Diff. 0.0 1/8/01 11:46
	Compound AR1248 AR16: 49,50 07JAN0 Compound	Nominal Amount (ppb) 200 11329,23 Nominal Amount (ppb)	Cald Amour 20 Cald Amour	Date: Time: ot (ppb) Date: Time:	1/8/01 11:23 % Diff. 0.0 1/8/01 11:46
	Compound AR1248 AR16: 49,50 07JAN0 Compound	Nominal Amount (ppb) 200 11329,23 Nominal Amount (ppb)	Cald Amour 20 Cald Amour	Date: Time: ot (ppb) Date: Time:	1/8/01 11:23 % Diff. 0.0 1/8/01 11:46
	Compound AR1248 ard File: 49,50 07JAN0 Compound AR1254	Nominal Amount (ppb) 200 11329,23 Nominal Amount (ppb)	Cald Amour 20 Cald Amour	Date: Time: Date: Time: Date: Time: Date: Time: Date: Date: Time:	1/8/01 11:23 % Diff. 0.0 1/8/01 11:46
eck Standa	Compound AR1248 ard File: 49,50 07JAN0 Compound AR1254	Nominal Amount (ppb) 200 11329,23 Nominal Amount (ppb) 200	Cald Amour 20 Cald Amour 20	Date: Time: Date: Time: Date: Time: Date: Time: Date: Time:	1/8/01 11:23 % Diff. 0.0 1/8/01 11:46
eck Standa	Compound AR1248 ard File: 49,50 07JAN0 Compound AR1254	Nominal Amount (ppb) 200 11329,23 Nominal Amount (ppb)	Cald Amour 20 Cald Amour	Date: Time: Date: Time: Date: Time: Date: Time: Date: Time:	1/8/01 11:23 % Diff. 0.0 1/8/01 11:46



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

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645.81.20 SAMPLE	21 <i>KR</i> S	6 A-	ŽVK.	BU	WAY CAN	& SAN	<i>xi</i> io			/	A STREET	' / .		//	//	//			į
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Anw-3A	12/26/00	1700		K	WZY	1114			2	. \					- A	I SAMDI	25000	seurce 4°C	
Anw-10A	12/20/10	1035		X	4774	- 1			2	- 1					- <i>f</i>	IEASE AL	A1 1/26	SEURDE Y'C AS PER KRSG GAYP MIYTUI RESURS TO	>
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6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

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6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120 PAGE 1 of

CHAIN OF CUSTODY RECORD

PROJ. NO 645.81.20 SAMPLER	SER	56 A	- 5	,	680m	oun	th Samplish					\$1.7X				/	
STA. NO.	DATE	TIME	COMP.	GRAB		STAT	ION LOCATION				7 /	//	//				REMARKS
Amw-9A	12/2B/ac	1720		X	WZ	4119			2 :	X				-	All S	2 mVa	s Plesopier Pyol
Amw-8A Ridse	12/29/00	1250		X	WZ	•			7	X				_	PRASO	ANALI	12T AS DOR KRSG TOMON
Riuse Blank	12/29/00	1400		X	WY	1122	,		2	X					Ause :	Fres.	S Plesopuso C You YEL AS DOR KESS ONDO MAYTIM RESURS TO
								19)							Bul	1ch	DATH ROAD D.J. 13214
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0/23/95 0611881 CDD						Di	itribution: Original Accom	panies	SI	∍nt; Co	py t	o Coor	dinato	r Field		<u>~</u>	1401 1100

	SEVERN TREN	T LABORATOR	ries log-in	SHEET - For	m DC-1
ab Name: Seve	m Trent Laboratories - V	<u> </u>			Sade of
Received By (Print	Name): Jen	remy Jir	ik		Log-in Date: 12/28/60
Received By (Signa	ature): feren	The	:	ORRESPONDI	·
Case Number:	20000			ORRESPONDE	NG
Sample Delivery	•				REMARKS: CONDITION
Group No:	KA6323	CLIENT	SAMPLE	ASSIGNED	OF SAMPLE SHIPMENT,
ETR Number:	81154	SAMPLE #	TAG#	LAB#	ETC
REMARKS:	•	4:74114	N/A	441382	Were air bubbles present
1. Custody Seal	Present beent	W74115	.,,	441383	in any VOA viais?
	Inter Broken	6:74116	0	441384	Samles Por'd
2. Custody Seal No	15.: <u>N/A</u>	474117.	<u>.</u>	441385	intact cyulu
3. Chain-of-Custoe	dy				custalispalion
Records	Present/Alsent*				cottich of recles
4. Sample Informa	ation				
Sheets	Present Dsent		····		
5. Airbill	ArbillySticker				
	Fresent Absent*				
. Airbill No.: 82	36033 72503				
7. Sample Tags	Present bsent				
Sample Tag					
Numbers	Listed Not Listed		·		
. (on Chain-of-Custociy				
8. Sample					
Condition:	Intacy Broken				
	Leaking.				
9. Does informatio	n on the custody				·
records, sample	information sheets,				<u> </u>
sample tags and	labels agree?				*
	78 No.*				
10. Date Received	ar Lab: 12/25/CC				
11. Time Received					
12 Cooler Tempe	rature: 3°C				
Sample Transfer					
Fraction: All					
Ara #: Level	4 prides				1
Ev. (SE)	<u> </u>				000
On: 1/25/2	j			`	
* Contact Project D Reviewed by:				Lagback No	
TONEWOOD OF.				2	
Date:				Logbook Page N	ło.:

ab Name: Severn	Trent Laboratories - VT				Page of
Received By (Print)	Name): Jack	L Dus	tis	,	Log-in Date: 12/30/00
Received By (Signat	ture): Jack	-LDot	in		
Case Number:			C	ORRESPONDII	1G
Sample Delivery					REMARKS: CONDITION
Group No:	KALZZZ	CLIENT	SAMPLE	ASSIGNED	OF SAMPLE SHIPMENT,
ETR Number:	81180	SAMPLE#	TAG#	LAB#	ETC.
REMARKS:		W74118	NA	44 1549	Were air bubbles present
l. Custody Seal	Present Absent	W74120	$\overline{\psi}$	441550	in any VOA vials? NA
	(ntaci)Broken				Samples receile
2. Custody Seal No	os.:				intact in coole
3. Chain-of-Custo	dy S			· · ·	with ice. Coole
Records	Present Absent*		 , <u></u>		received intact
4. Sample Inform	ation	· `			as were custo
Sheets	Present Absent*				Seals,
5. Airbill	Airbill Sucker				
	Present/Absent*				
6. Airbill No.: 8	722542844913			<u> </u>	
7. Sample Tags	Present Absent			<u> </u>	
Sample Tag					
Numbers	- Listed Not Listed				
	on Chain-of-Custody				
8. Sample					
Condition:	Intacy Broken*				
	- Leaking				
9. Does informati	on on the custody				
records, sampl	e information sheets,				
sample tags an	d labels agree?				
	(Yestion				
10. Date Received	1 at Lab: 12/29/00				JZD
1	d: 1010				13/30/0
12. Cooler Tempo					
Sample Transfer					
Fraction: A					
Area #: LU By: Joch	L Desti			<u> </u>	
[\ \- \ \- \ \				†	
* Contact Project 1			<u> </u>	_	
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Date:			1499-A	Logbook Page	No.:

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Lab Name: Severn	Trent Laboratories - V	<u> </u>			Page of
Received By (Print N	lame):	eremy S	nk_	· .	Log-in Date: 1 <u>2/30/10</u>
Received By (Signati	re): fer	my Li	k:		
Case Number:		; .	.` .	ORRESPONDI	NG
Sample Delivery	•				REMARKS: CONDITION
Group No:	42323	CLIENT	SAMPLE	ASSIGNED	OF SAMPLE SHIPMENT,
ETR Number: 8	··································	SAMPLE #	TAG#	LAB#	ETC.
REMARKS:	· · · · · · · · · · · · · · · · · · ·	W74119	N/A	441595	Were air bubbles present
1. Custody Seal	Presentalboent*	W74121	71	441596	in any VOA vials? NA
	(ntac) Broken	474122	Й	441597	Sarples rec'd
2. Custody Seal Nos	.: N/A				intact as were
3. Chain-of-Custody	,				Centraly Seals on
Records	Present Alisent*				outside of cooler
4. Sample Informat	ion				
Sheets	Presenvabsent				
5. Airbill	Airbil/Sticker				
	Tresent Absent		•	·	
6. Airbill No.: 82	2542844902			-	
7. Sample Tags	Presentlebsent				
Sample Tag	•				•
Numbers	Listed Not Listed				
	on Chain-of-Custody				
8. Sample					
Condition:	niac Broken*				
	Leaking				
9. Does information	on the custody				
records, sample in	oformation sheets,				
sample tags and l					
,	Ye No.*				
10. Date Received a	1 1		<u> </u>		
11. Time Received:	1030				
12. Cooler Tempera	ture: 3(·			
Sample Transfer	<i>-</i>				
Fraction:	/////				
Area #: Lovel	Thodae				•
By:			1/0		
On: 6/30/20)		FJ		
* Contact Project Dir Reviewed by:			•	Logbook No.: _	
Date:		·	9a_ R	Logbook Page N	To.:
_au.		OY	99-B		SM-2012A-1116

** COOLER RECEIPT CHECKLIST **

			_	
		ATTOMAN	PRESENT ON THE	AAAI BBAA
Α.	/ L D L			
/ Y	P P. P.			



NO

IF SO, WERE THERE CUSTODY SEAL NUMBERS?

YES



LIST THE CUSTODY SEAL NUMBERS.

--/

WHAT TYPE OF COOLING WAS UTILIZED?

ICE

MELTED ICE

PACKS

NONE

^OOLER TEMPERATURE (degrees c):

3°C

DATE AND TIME COOLER RECEIVED:

17-28-D

0930

DO SAMPLES APPEAR TO BE INTACT:

(YES)

NO

DO ANY SAMPLES HAVE SHORT HOLDING TIMES? (less than seven days)

WET CHEM

YES



EXTRACTABLES

YES



UNPRES VOA

YES



RADIATION SCREEN RESULTS < 0.05 MR/HR

YES

NO

** COOLER RECEIPT CHECKLIST **

VERE !	CUSTODY	SEALS	PRESENT	ON THE	COOLERS?
--------	----------------	--------------	----------------	--------	-----------------



NO

IF SO, WERE THERE CUSTODY SEAL NUMBERS?

YES



LIST THE CUSTODY SEAL NUMBERS.

WHAT TYPE OF COOLING WAS UTILIZED?



MELTED ICE

PACKS

NONE

COOLER TEMPERATURE (degrees c):

32

DATE AND TIME COOLER RECEIVED:

12/29/00

1010

DO SAMPLES APPEAR TO BE INTACT:

YES

NO

DO ANY SAMPLES HAVE SHORT HOLDING TIMES? (less than seven days)

WET CHEM

YES

NO

EXTRACTABLES

YES

NO

UNPRES VOA

YES

NO

RADIATION SCREEN RESULTS < 0.05 MR/HR

YES

NO

SEVERN TRENT LABORATORIES -VT

SM.0002.031198

ישו כווישר	CTICTODY	CYPAYO	DDECENT	ONL THE A	OOT TIL
LKL	COSTONI	DEALS	PRESENT	UN THE	スノしノしょじょう

(YES)

NO

IF SO, WERE THERE CUSTODY SEAL NUMBERS?

YES

NO

LIST THE CUSTODY SEAL NUMBERS.

WHAT TYPE OF COOLING WAS UTILIZED?

ICE

MELTED ICE

PACKS

NONE

COOLER TEMPERATURE (degrees c):

3

JATE AND TIME COOLER RECEIVED:

12/30/00

1030

DO SAMPLES APPEAR TO BE INTACT:

YES

NO

DO ANY SAMPLES HAVE SHORT HOLDING TIMES? (less than seven days)

WET CHEM

YES

NO).

EXTRACTABLES

YES



UNPRES VOA

YES



ADIATION SCREEN RESULTS < 0.05 MR/HR



NO

			\		-							1385MD	1385MS		1384					STL Sample ID / 48 m. NO.
									_			BULLIAL M	SULTIFICA	L. 11 HLM	91111C	SILALM	Œ	LCS NB	\succeq	02 323 34 29/0
												450	950	0 46	910	970	9.70	0001	000	Sample Vol. (1000ml). Measure entire sample volume using a Grad. Cylinder. Trans. to Sep.
												K	7	-	7	V	7	7	r 1	Surr. 200 uL Pest Surr (DCB/TCX) 0.2 ppm
												K	\	X	X	X	X	<u> </u>	X	(5.0ppm) to MS/MD/LCS only
						•						<							3	Check PH between 5-9. If PH needs to be adjusted use 6N NaOH or 50% H2SO4. Rinse 1.0 Liter bottle and Grad.
				, ,								é						-		Rinse 1.0 Liter bottle and Grad. Cylinder w/ 60mls CH2CL2. Trans. to Sep. Funnel Shake 2 min. Decant thru Na2SO4 funnel into K-D set-up.
								25				4						_	5	Shake 2 min. Decant thru Na2SO4 funnel into K-D set-up.
							ľ	7				<		_				_	556	Repeat 2(X)
L								12/				<	-					_		Hexane Exchange w/60ml Conc. to 2.0-3.0 mL. Transfer to a
							;	7/60				4						1	حَ	16mi viai.
								Ŏ				<							기	Add Approx. 5 mls Sulfuric Acid (H2SO4) to sample. Shake for 1 min. Add Approx. 5 mls Sulfuric Acid (H2SO4) to sample. Shake for 1
												*							5	Add Approx. 5 mis Sulfuric Acid (H2SO4) to sample. Shake for 1 min. Pull off Hexane layer and trans. To a K-D bottom. Rinse Acid layer w/ 1-2 mis hexane, transfer rinse to K-D.
Ĭ,												€							'	Conc. to approx. 1.0 mL 7145.
ŀ												6								Conc. to approx. 1.0 mL Add the extract to a 3 gram 3% deactivated silica gel column.
												4						_	53(+	Eiute w/ 60 mls Hexane
												4						-	27	Conc. to approx. 1.0 mL Add the extract to a 3 gram 3% deactivated silica gel column. Eiute w/ 60 mls Hexane Conc. to 1.0 mL. Transfer to a clear 2ml vial. Give extract w/paperwork to GC.

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STL Sample ID STL Sa				1	1		1	1			1								
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STL Sample ID Conc. to 2.0-3.0 mL. Transfer to a clear Zmin vial. Pull off Hexane Layer and trans. To a K-D bottom. Rinse Acid layer with 1-2 mls hexane, transfer to a clear Zmin vial. Conc. to 1.0 mL. Transfer to a clear Zmin vial. Conc				-	7	-	+	-					7	\langle	~	odly o	ł		4415
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Client ID ANALYST: MITXLOT # CNICOT # CNICOT # CNICOT # CNICOT # CH2CI ₂ LOT # CNICOT		de	Εi	Ad	C	To W/	(<u> </u>	Н	R	s	R	In	(5	s	8 e C			,
ANALYST: MY SURR LOT # CP1100001 SPIKER: MM		oacerwork to GC	lute w/ 60 mls Hexane	dd the extract to a 3 gram 3% eactivated silica gel column.	onc. to approx. 1.0 mL	o a K-D bottom. Rinse Acid layer : / 1-2 mls hexane, transfer rinse	H2SO4) to sample. Shake for 1		exane Exchange w/60ml	epeat 2(X)	hake 2 min. Decant thru	linse 1.0 Liter bottle and Grad. Sylinder w/ 60mls CH2CL2.	eads to be adjusted use 6N	5.0ppm) to MS/MD/LCS only	Surr. 200 ul. Pest Surr	Sample Vol. (1000ml), Measure entire sample volume using a Grad. Cylinder. Trans. to Sep.	Client ID	STL Sample ID	多多多
IT: BLABO2 ANALYST: PMP SURR LOT # CPN 10 000		4	na de la constanta	J. 10. 11 4 1	- 1	NEW SE S.	1	ACTIVITY OF	THE STATE OF THE S	医	A AVECTOR	Part and the		2 × × ×	F-5/14		STATE VERF		
T BLABO2 ANALYST: Δηβ SURR LOT # CPη 1/2 000				4047	70'	OT#	12SO4 L		- •			#	IL LOT	FLORIS			12/30/00	·	DATE
T: BLABO2 ANALYST: ΔΜΕ (Naiamazoo) SURR LOT # CPH, 10 000 2000 SPIKER: ΔΜΕ ΜΤΧ LOT # (ΟΝ 124 000 16 16 16 16 16 16 16 16 16 16 16 16 16 1		9030	175	1159	774	::LOT#	HEXANE	~ ~	•	M	+	# 00.	אר באר אורסד	_		1107	61180, 9		ETRZ
BLABO2 ANALYST: PM SURR LOT # CPH.)X		?		24 00	100	T #	OT XLV	•	• •	//	SE C	;; , 29	SPIKE		1		20000 KALS73		SDG:
			ست	100 B DA	7430	OT#	iURR L		\alama;			ة ا .	ANAL		(_	BLABO2		CLIEN

Appendix M

Calculation of Attenuation Capacity

Appendix M - Calculation of Attenuation Capacity

The values of TOC were obtained by the following:

TOC = site-specific organic matter content $\times 1.724^{-1}$

The site-specific organic matter content can be seen on Table 5-1. Thus, the TOC at WB/A-OU varies between 16 and 40%.

The residuals attenuation capacity can be estimated from the distribution coefficient (K_d).

K_d ∝ PCB concentration sorbed to organic matter in residuals PCB concentration dissolved in water at equilibrium

which is the ratio of PCB concentration sorbed to organic matter in the residuals to the concentration dissolved in water at equilibrium.

The distribution coefficient is related to organic carbon content fraction according to the equation:

$$K_d = K_{oc} \times f_{oc}$$

where:

 K_{d} is the distribution coefficient; K_{oc} is the organic carbon partitioning coefficient; and f_{oc} is the fraction of organic carbon.

This equation is usable when $f_{oc} > 0.1\%$. Several empirical relationships have been developed to relate K_{oc} to the octanol/water partition coefficient K_{ow} of hydrophobic chemicals. K_{ow} is a measurement of a chemical's distribution at equilibrium between octanol and water. In addition to being a key variable in the estimation of K_{oc} , K_{ow} can also be used to assess environmental fate and transport of organic chemicals. Based on a octanol-water partitioning coefficient range of 4.5 to 5.8 [Mackay, et al., 1992], a K_{oc} for Aroclor 1242 is estimated to be approximately 100,000. The maximum theoretical K_d would then be approximately 40,000 for some portion of the residuals. The theoretical method used for calculating K_d for Aroclor 1242 can be summarized as follows:

- Determine K_{ow} from chemical references (for Aroclor 1242, the mean log K_{ow} used is 5.2);
- Convert K_{ow} to K_{oc} using the equation (Karickhoff, et al. 1979):

$$K_{oc} = 0.63 \text{ x } K_{ow}$$

 $[K_{oc} \text{ for Aroclor } 1242 = 0.63 \text{ x } \log^{-1}(5.2) \text{ x } 100,000;$

- Determine f_{oc} from site specific measurement of fraction of organic matter, f_{om} , using Van Bemmelen factor (maximum f_{oc} at WB/A-OU = 70% x 1.724⁻¹ x 0.4); and
- Compute K_d by:

$$K_d = K_{oc} \times f_{oc}$$

(Maximum theoretical K_d for Aroclor 1242 = 100, 000 x 0.4 = 40,000).

The table below presents theoretical maximum K_d values for relevant Aroclors. The mean K_{ow} values were obtained from Mackay, et al., 1992. In all the cases the site-specific maximum organic carbon content (70%) was used to estimate f_{oc} .

Aroclor	1260	1254	1248	1242	1232	1221
log K _{ow}	6.90	6.45	6.05	5.15	4.65	4.40
log K _{oc}	6.70	6.25	5.85	4.95	4.45	4.20
log K _d	6.30	5.85	5.45	4.55	4.05	3.80

The K_d values indicate that sorption is occurring and that the leading edge of the contaminant will migrate at a slower rate than the groundwater. This process is commonly referred to as retardation. The results show the residuals results in a relatively high attenuation capacity for PCB.

Appendix N

Pairwise Comparison of Alternatives

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

WILLOW BOULEVARD/A-SITE OPERABLE UNIT REMEDIAL INVESTIGATION/FOCUSED FEASIBILITY STUDY

PAIRWISE COMPARISON OF ALTERNATIVES

	Weighting Factors->	5	5	3	3	3	3	3	1	1			
Remedial Alternative	Description	Overall protection of human health and the environment	Compliance with ARARs	Long-term effectiveness and permanence	Reduction of toxicity, mobility, or volume	Short-term effectiveness	Implementability	Cost	State acceptance	Community acceptance	MUS	Weighted Sum	Final Ranking
1	No Action	5	5	5	5	5	15	15	5	5	65	195	6
2A	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	9	11	10	11	13	13	11	8	7	93	289	2
2В	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re- Grade/Stabilize Banks, 50' Setback	9	11	10	11	13	9	9	10	9	91	275	4
2C	Consolidation/Containment of Selected Materials, Re-Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	9	11	10	11	13	11	13	12	11	101	297	1
3	Removal and Off-site Disposal as "Mega Rule" Waste	15	11	15	11	7	5	5	15	15	99	289	2
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	13	11	10	11	9	7	7	10	13	91	275	4

⁽¹⁾ Contingent present worth cost for implementaion of a groundwater remedy if it is found that groundwater transport of PCB's is occurring to surface water.

Willow Boulevard/A-Site Nine criteria comparison of alternatives

Pairwise comparison for criterion:

1 Overall protection of human health and the environment

		3 = Rov	w better than	Column, 2	= Row sam	e as Colum	n, 1 = Row	worse than	Column
		1	2A	2B	2C	3	4	Sum	Rank
1	No Action	X	1	1	1	1	1	5	6
24	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	3	X	2	2	1	1	9	3
28	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	3	2	X	2	1	1	9	3
20	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	3	2	2	X	1	1	9	3
3	Removal and Off-site Disposal as "Mega Rule" Waste	3	3	3	3	Χ	3	15	1
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	3	3	3	3	1	X	13	2

Willow Boulevard/A-Site Nine criteria comparison of alternatives Pairwise comparison for criterion:

2 Compliance with ARARs

		3 = Row	/ better than	Column, 2	= Row sam	e as Colum	n, 1 = Row	worse than	Column
		1	2A	2B	2C	3	4	Sum	Rank
1	No Action	Х	1	1	1	1	1	5	6
2/	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	3	X	2	2	2	2	11	1
2E	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	3	2	X	2	2	2	11	1
20	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	3	2	2	X	2	2	11	1
3	Removal and Off-site Disposal as "Mega Rule" Waste	3	2	2	2	Χ	2	11	1
4	Removal of Residuals from Willow Boulevard and	3	2	2	2	2	X	11	1

Willow Boulevard/A-Site Nine criteria comparison of alternatives **Pairwise comparison for criterion:**

3 Long-term effectiveness and permanence

	_	3 = Row	3 = Row better than Column, 2 = Row same as Column, 1 = Row worse than Column 1 2A 2B 2C 3 4 Sum Rank X 1 1 1 1 5 6 3 X 2 2 1 2 10 3 3 2 X 2 1 2 10 3						
		1	2A	2B	2C	3	4	Sum	Rank
1	No Action	Х	1	1	1	1	1	5	6
2A	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	3	X	2	2	1	2	10	3
2E	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	3	2	X	2	1	2	10	3
20	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	3	2	2	X	1	2	10	3
3	Removal and Off-site Disposal as "Mega Rule" Waste	3	3	3	3	Χ	3	15	1
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	3	2	2	2	1	X	10	2

Willow Boulevard/A-Site Nine criteria comparison of alternatives

Pairwise comparison for criterion:
4 Reduction of toxicity, mobility, or volume

		3 = Row better than Column, 2 = Row same as Column, 1 = Row worse than Colum							
		1	2A	2B	2C	3	4	Sum	Rank
1	No Action	Χ	1	1	1	1	1	5	6
2A	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	3	X	2	2	2	2	11	1
2B	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	3	2	X	2	2	2	11	1
20	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	3	2	2	X	2	2	11	1
3	Removal and Off-site Disposal as "Mega Rule" Waste	3	2	2	2	X	2	11	1
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	3	2	2	2	2	X	11	1

Willow Boulevard/A-Site Nine criteria comparison of alternatives Pairwise comparison for criterion:

5 Short-term effectiveness

3	= Row	petter than	n Column, 2	= Row sam	ie as Colum	in, 1 = Row	worse than	Column
	1	2A	2B	2C	3	4	Sum	Rank

		1	2A	2B	2C	3	4	Sum	Rank
1	No Action	Х	1	1	1	1	1	5	6
2A	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	3	X	2	2	3	3	13	1
2B	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	3	2	X	2	3	3	13	1
2C	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	3	2	2	X	3	3	13	1
3	Removal and Off-site Disposal as "Mega Rule" Waste	3	1	1	1	Χ	1	7	4
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	3	1	1	1	3	Х	9	5

Willow Boulevard/A-Site
Nine criteria comparison of alternatives
Pairwise comparison for criterion:
6 Implementability

3 = Row	/ better thar	n Column, 2	= Row sam	ie as Colum	ın, 1 = Row	worse th	an Column
		1				T	

		1	2A	2B	2C	3	4	Sum	Rank
1	No Action	Х	3	3	3	3	3	15	1
2A	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	1	X	3	3	3	3	13	2
2B	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	1	1	X	1	3	3	9	4
	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	1	1	3	X	3	3	11	3
3	Removal and Off-site Disposal as "Mega Rule" Waste	1	1	1	1	· X	1	5	6
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	1	1	1	1	3	X	7	5

Willow Boulevard/A-Site
Nine criteria comparison of alternatives
Pairwise comparison for criterion:

7 Cost

Comparison Weight

3 = Row better than Column, 2 = Row same as Column, 1 = Row worse than Column

		1	2A	2B	2C	3	4	Sum	Rank
1	No Action	X	3	3	3	3	3	15	1
2A	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	1	X	3	1	3	3	11	3
2B	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	1	1	X	1	3	3	9	4
2C	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	1	3	3	X	3	3	13	2
3	Removal and Off-site Disposal as "Mega Rule" Waste] 1	1	1	1	Χ	1	5	6
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	1	1	1	1	3	Х	7	5

Willow Boulevard/A-Site
Nine criteria comparison of alternatives
Pairwise comparison for criterion:

8 State acceptance

Comparison Weight

3 = Row better than Column 2 = Row same as Column 1 =

3 = R0W	better than	Column, 2	= Row sam	ie as Colum	n, T = Row	worse than	Column
1	2A	2B	2C	3	4	Sum	Rank

_		1	2A	2B	2C	3	4	Sum	Rank
1	No Action	Х	1	1	1	1	1	5	6
2A	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	3	X	1	1	1	2	8	5
2B	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	3	3	X	1	1	2	10	3
	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	3	3	3	X	1	2	12	4
3	Removal and Off-site Disposal as "Mega Rule" Waste	3	3	3	3	Χ	3	15	1
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	3	2	2	2	1	Х	10	2

Willow Boulevard/A-Site Nine criteria comparison of alternatives

Pairwise comparison for criterion:

9 Community acceptance

		Comparison Weight 3 = Row better than Column, 2 = Row same as Column, 1 = Row worse than Column								
		1	2A	2B	2C	3	4	Sum	Rank	
1	No Action	Х	1	1	1	1	1	5	6	
2A	Consolidation/Containment of Selected Materials and Install New Sheet Piling at Willow Boulevard	3	X	1	1	1	1	7	5	
2B	Consolidation/Containment of Selected Materials, Remove All Sheet Piling, Re-Grade/Stabilize Banks, 50' Setback	3	3	X	1	1	1	9	4	
2C	Consolidation/Containment of Selected Materials, Re- Grade/Stabilize Banks using Eco-Friendly Options at Willow Boulevard	3	3	3	X	1	1	11	3	
3	Removal and Off-site Disposal as "Mega Rule" Waste	3	3	3	3	Χ	3	15	1 1	
4	Removal of Residuals from Willow Boulevard and Consolidation at A-Site	3	3	3	3	1	Х	13	2	

Appendix O

Kalamazoo River Study Group Dispute & Comment to December 2003 RI/FFS (January 15, 2004)





Transmitted Via E-Mail and Federal Express

January 15, 2004

J. Brian von Gunten
Project Manager
MDEQ-ERD
Superfund Section
Constitution Hall
525 W. Allegan St., 3rd Floor South
Lansing, MI 48933

Re: Draft Remedial Investigation/Focused Feasibility Study Report for the Willow Boulevard/A-Site Operable Unit

Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site Administrative Order by Consent between Michigan Department of Environmental Quality and Allied/HM Holdings, Inc., Georgia-Pacific Corporation, and Simpson Plainwell Paper Company. File No. DFO-ERD-91-001 dated December 28, 1990

BBL Project #: 645.81.500

Dear Brian:

On December 28, 2003, Blasland, Bouck & Lee, Inc. (BBL), on behalf of the Kalamazoo River Study Group (KRSG), received the Michigan Department of Environmental Protection's (MDEQ) latest draft of the Remedial Investigation/Focused Feasibility Study (RI/FFS) Report for the Willow Boulevard/A-Site Operable Unit (WB/A-Site OU) of the Kalamazoo River Superfund Site. Pursuant to Paragraph 36 of the Administrative Order by Consent (AOC) between the MDEQ and the members of the KRSG, we are invoking dispute resolution over the application of sediment cleanup objectives to soils, as described in the RI/FFS (e.g., page 6-8).

The application of sediment criteria for polychlorinated biphenyls (PCBs) established in the Baseline Ecological Risk Assessment for protection of aquatic ecosystems (0.5 – 0.6 milligrams per kilogram [mg/kg]) to soils that are, in theory, submerged as infrequently as once every 100 years is arbitrary. The sediment criteria referenced in the RI/FFS were developed as Preliminary Remediation Goals (PRGs) for sediments in the BERA to be protective of mink. A simple model of partitioning of PCB between sediment and the overlying water column and bioaccumulation in fish was used to calculate no-effect-and lowest-effect-based PRGs. This underlying model does not apply to soils that may only be submerged once every 100 years. The model is only reasonably applied to sediments in an aquatic ecosystem.

The KRSG's additional comments on the December 2003 draft RI/FFS for the WB/A-Site OU are attached (Attachment A) for your consideration.

The KRSG desires an efficient resolution of this dispute so the RI/FFS can be finalized and we can move forward implementing a final remedy at the WB/A-Site OU. Please call me if you have questions or would like to discuss the issues raised in this letter or in the attached comments.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

NalySeon

Mark P. Brown, Ph.D. Senior Vice President

MFE/tld Enclosure

cc:

Shari Kolak, United States Environmental Protection Agency

Bonnie A. Barnett, Esq., Drinker Biddle & Reath LLP J. Michael Davis, Esq., Georgia-Pacific Corporation Paul A. Montney, P.E., Georgia-Pacific Corporation

Joyce S. Schlesinger, P.E., ENVIRON

Patrick N. McGuire, Blasland, Bouck & Lee, Inc.

Attachment A Comments on MDEQ's December 2003 Draft Willow Boulevard/A-Site RI/FFS

General Comments

1. The RI/FFS places undue focus on groundwater.

Although, as the RI/FFS acknowledges, there are no findings of risk related to groundwater, there is lengthy consideration of a potential groundwater remedy. MDEQ refers to the remedial measures proposed for groundwater as a "contingent" remedy and has allocated a significant level of detail included in the FFS about groundwater remediation. This is evident in discussions of ARAR compliance (page 7-10), the incorporation of costs for groundwater treatment in the costs for alternatives and the inclusion of elements of the design of the groundwater remedy. In addition, on page 6-6 the FS report concludes that risks will be further evaluated through a groundwater monitoring program because the current network "is insufficient to definitively determine if groundwater/leachate poses unacceptable risk", however, the highest ranked alternative includes provisions for a groundwater remedy.

MDEQ had previously agreed (January 23, 2001 meeting as documented in a letter from BBL to MDEQ dated January 31, 2001) that the approach to groundwater would be the same as the approach taken at the King Highway Landfill Operable Unit. The ROD would specify that groundwater monitoring will be part of the remedy. The monitoring program would be described in detail in a Hydrogeological Monitoring Plan that would include a contingency plan. The contingency plan would be a protocol that reacts to results of monitoring and would lead to a groundwater remedy if risks related to groundwater were found to be significant. We recommend that agreed-upon course be followed.

2. Sediment Cleanup Objectives are applied arbitrarily to soils which, in theory, are submerged as infrequently as once every 100 years. On pages 6-8 and 6-9, sediment criteria (PCB concentrations ranging from 0.5 to 0.6 mg/kg) reported in the Baseline Ecological Risk Assessment that were developed using assumptions and an analysis of PCB bioaccumulation appropriate for an aquatic ecosystem are being used as response objectives for soils. There is no defensible scientific basis for applying these sediment criteria to soils, particularly for soils which, in theory, are only submerged once every 100 years.

It does not appear that the sediment criteria are used to determine the extent of soil removal in the conceptualized remedial alternatives. Instead, ecological risk-based criteria for soils (6.5 – 8.1 mg/kg) developed considering exposure in the terrestrial ecosystem are employed, as appropriate. There is an implication that removal of soils with PCB concentrations above the soil cleanup objective will result in achievement of the RRO based on the lower sediment criteria. This confusion could be avoided if the soil RRO based on the sediment criteria were eliminated, or at least not applied to soils that are inundated for less than two months per year.

There is also some inconsistency concerning whether the soil criteria can be applied on a spatial average basis or as not-to-exceed values. On page 6-8 the footnote indicates spatial averaging is acceptable, but in the description of alternatives (see page 7-7 for an example) the criteria are evidently applied as not-to-exceed values. We believe that spatial averaging as described on page 6-8 is appropriate and consistent with the derivation of the criteria.

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3. An "ecologically-friendly" setback at Willow Boulevard is part of the highest ranked alternative even though this approach does not appear to be based on risk reduction. The precedent is concerning, as the potential risks, environmental impacts, and costs of this approach may be significant. The setback distance is not specified; however, the cost estimate for the setback presented in Table 7-C is similar to the cost for the 50-foot setback included in Subalternative 2B.

In the description of Subalternative 2C in Section 6.3.2.3 on page 6-15, the last sentence states that, "This alternative attempts to be responsive to the community's desire to reduce the landfill footprint and have a component of the remedy address aesthetics and habitat issues." There is no indication that this approach will be more protective of human health and the environment than alternatives that include components such as sheetpile. While we are certainly not opposed to the incorporation of features designed to garner community support for an alternative, we question the risk management tradeoff being made in this instance. There are several statements that imply the community would prefer to avoid the use of sheetpile. However, the structural benefits sheetpile offers for risk management are not addressed. Further, the basis for expressing community preferences in this regard is not clear. We do not believe that the characterization of the community's preferences included in the draft RI/FFS are based upon an assessment of the preferences of the neighbors of the landfills who are represented by the Lakeside Neighborhood Association. Georgia-Pacific has met with the Association a number of times to keep them informed of progress.

- 4. The evaluations of short-term effectiveness and implementability of intrusive remedial alternatives (e.g., Subalternative 2B ... remove sheetpiling and establish 50' setback ...; Alternative 3 Removal and Off-Site Disposal; and Alternative 4 Removal of Residuals from Willow Boulevard) characterize construction of these alternatives as relatively easy and without significant adverse short-term risks to human health and the environment. The implementability and implementation risks of these alternatives should be analyzed further.
- 5. Regulations and requirements may be misinterpreted in several instances.

 On page 7-11 and elsewhere, the new landfill requirements of Part 115 of NREPA are inappropriately applied. Furthermore, compliance with those "requirements" is inaccurately assessed. One example (page 7-11) is "Because the landfill does not have a liner or a leachate containment system, there must be a four foot separation distance between the waste and groundwater." In following text, it is stated that Alternative 2 could meet this separation criterion. It appears that this separation criterion is being used to support the "ecologically friendly" setback option discussed in comment #3 above (page 7-19, "Assuming that the setback would achieve the required separation between waste and surface/groundwater..."). We are not aware of any regulatory requirement applicable in this case that warrants separation between waste and groundwater. Such a requirement could not be met by any alternative that contains the waste in place. It is also less than clear that Part 31 of PA451 regulates groundwater beneath the OU as indicated by the RI/FFS (see, for example, page 7-11).
- 6. Estimated costs for Alternative 3 Removal and Off-Site Disposal, are unrealistically low. The alternative assumes that a landfill would accept TSCA waste with the permission of USEPA and dispose of it as non-TSCA waste at \$25/cubic yard for transport and disposal (T&D). This appears unrealistic and this assumption has a significant impact on the overall cost of the alternative.

- 7. There are number of references used to support MDEQ's assessment of conditions at the OU and community acceptance of each alternative as well as cited correspondence with the USEPA that we would like to review. We request the documents listed below.
 - Cibulskis, K. (USEPA) e-mail to MDEQ re: additional comments to Willow Boulevard/ Asite RI/FFS, July 8, 2003.
 - Drenth, H., Kalamazoo County Board of Commissioners, letter to Director, Kalamazoo County Board of Commissioners, re: proposed remedial action plan at Georgia-Pacific Corporation's Willow Boulevard landfill, May 15, 1990.
 - Edgar, C.E., Department of Army, Regulatory Guidance Letter 85-07. July, 1985.
 - Geitka, M. (MDNR) Summary of issues raised at public meeting discussing Willow/A September 28, 1984 (Note, BBL believes the meeting was September 28, 1994).
 - Kalamazoo River Area of Concern Public Advisory Council (PAC), Interests and Concerns, PCBs and Kalamazoo River Impairments, March, 1998.
 - Mehne, C., DVM. Report of biota habitat of the Davis Creek watershed. February 10, 1996.
 - Mehne, C., DVM. Letter to MDEQ. Observed Willow Blvd/A-site animal populations (summary of field notes from 5/3/95, 5/18/95, 7/13/95 and 1/9/96). March 26, 2002.
 - Michigan Environmental Council, Letter to MDEQ, 2003 re: Comments to the Draft RI/FS for the Kalamazoo River (not listed in reference section)
 - Moore, 1984 (as cited on page 7-51, a complete citation was not provided).
 - Short, T. (USEPA), comments on Willow Blvd/A-site OU RI/FFS (draft). May, 2001.
 - Short, T. (USEPA), comments on Willow FS. February, 2002a (draft).
 - Short, T. (USEPA), comments on Sections 6 and 7 of Willow Blvd RI/FS. March, 2002b (draft).
 - Short, T. (USEPA), e-mail to MDEQ re: Willow soil criteria. April, 2002c (draft).

Specific Comments

- In Section 1.2, the second sentence inaccurately describes Georgia-Pacific's ownership of the Mill. The Kalamazoo Paper Company owned and operated the Mill until 1967, not Georgia-Pacific
- 2. In Section 1.2.1, the last four sentences in this paragraph grossly misstate the function of the temporary cover placed over the Willow Boulevard Site. The temporary cover was constructed after an interim measure (i.e., removal of residuals from the River) was implemented. At the time of the removal action in 2000, it was anticipated that a final remedial alternative would be selected expeditiously, and Georgia-Pacific arranged for a local contractor to perform maintenance on the temporary cover. However, after three years, a

final remedy has not been selected, and the temporary cover system, which was not designed as a long-term measure, is showing only some signs of insignificant deterioration. We suggest these sentences be removed as they provide no benefit to the analysis of alternatives. This issue is repeated in Section 4.1.1.

- 3. Under Section 1.4 Enforcement History, the last paragraph is misleading and suggests the KRSG and BBL have not been responsive to MDEQ's concerns. This paragraph does not include a full description of the long history of the development of the RI/FFS report as illustrated in Figure 1. Absent from this text is any recognition that a final draft of the RI/FFS was developed in 1999 followed by a draft of the Proposed Plan, or that the MDEQ approved the use of a presumptive remedy approach only to decide after two drafts of the RI/FFS had been prepared to abandon this approach. There is no mention of the meeting on January 23, 2001 where MDEQ and KRSG met and discussed 125 comments, most of which were to expand the document to include information described in Technical Memorandum 9. MDEQ makes no mention of the letter dated November 1, 2001 where the remaining 25 minor comments were addressed and additional information provided to the MDEQ. In addition, in 2001 we were told by MDEQ's-project manger that the remaining changes were very minor, in fact "piddly" was the term used to describe them. The unresolved comments, if any, do not begin to account for the extensive changes made by MDEQ in this most recent draft.
- 4. Starting on page 2-30, the MDEQ states that certain Aroclors are identified. This is not a completely accurate characterization since PCBs were not actually identified as comprising a particular Aroclor, but rather were merely quantified as that Aroclor.
- 5. The statement in the last sentence of the second paragraph on page 3-6 is a non sequitur and does not belong in a section discussing site hydrogeology.
- 6. In Section 4.2.7, the fourth paragraph, the MDEQ implies that validation of historical data was attempted but could not be completed as prescribed in the QA/QC Review of Historical Studies Data Plan. This is incorrect. The prescribed method was followed, but the data could not be validated due to the lack of available QC data for the historic results.
- 7. In the last sentence on page 5-2, the statement that "...generic GSI values are intended to ensure that contaminants in groundwater are not discharged to surface water" is not accurate.
- 8. Portions of the RI report inappropriately include discussions specifying portions of the remedy. For example, in Section 5.3 there are references to studies and evaluations that would be part of a Hydrogeologic Monitoring Program, including evaluations of zinc, mercury, and leachate;
- 9. In Section 6.2.1.3 and several others, the MDEQ implies that PCB concentrations greater than 12 parts per quadrillion (ppq) for wildlife or 2.6 ppq for humans present a risk. This is not an accurate assessment, as these values assume there is no risk at these levels, they do not imply that there is risk if PCB levels are greater than these concentrations.
- 10. In Section 6.2.1.5, MDEQ suggests that the information gathered during the RI is "...insufficient to definitively determine whether groundwater/leachate poses an unacceptable risk...." This is an overstatement because with reasonable assumptions, as those considered in the KHL-OU Risk Assessment, there would be no risk associated with groundwater/leachate exposure. In the early versions of the Willow Boulevard/A-Site

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- RI/FFS, BBL calculated a site-specific GSI using MDEQ guidance; however the agency did not accept this attempt to illustrate that a risk did not exist using reasonable assumptions.
- 11. In Section 6.2.1.5 there is a discussion of a groundwater/leachate monitoring plan. This is not appropriate for a section discussing site risk.
- 12. In Section 7.2.2, description of Alternative 2, there are several subalternatives (e.g., On-Site Consolidation of Select Residuals) where sediment containing PCB concentrations of 6.5 to 8.1 mg/kg will be removed. This is inconsistent with the RRO for sediment. Additionally discussions of removal suggest that at any location where PCB concentrations exceed the criteria, the area will be re-excavated. This approach does not consider the use of spatial averaging as discussed in general comment #2, above.
- 13. Under Alternative 4 Compliance with ARARs, MDEQ states that Part 31 establishes state cleanup criteria to be used while "remediating rivers, creeks, and floodplain areas." This is not accurate and overstates the scope of Part 31.
- 14. It is not clear why a discussion of TSCA as an ARAR is only included in the analysis of Alternative 4.
- 15. The Weighting of Various Alternatives in Table 7-4 produces several counterintuitive results that suggest revision of the comparative analysis is warranted. For example, Alternative 3 (Complete Removal) is rated higher than three of the consolidation alternatives, and rated lower than only Alternative 2C, which is quite similar to the lesser rated consolidation alternatives.
- 16. Further site investigations for the King Mill pipe, residential soil sampling, and groundwater should not be specified in the RI/FFS for the WB/A-Site OU.

Appendix P

MDEQ Response to KRSG Dispute and Comment (January 30, 2004)





STATE OF MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY LANSING



January 30, 2004

Dr. Mark P. Brown Senior Vice President Blasland Bouck & Lee, Inc. 174 Union Street Suite 300 New Bedford, Massachusetts 02740

Dear Dr. Brown:

SUBJECT: Response to Blasland Bouck & Lee Comment On Final Remedial

Investigation/Focused Feasibility Study Report For the Willow Boulevard/A-Site (Operable Unit 2) of the Allied Paper/Portage Creek/Kalamazoo River Superfund

Site, Kalamazoo/Allegan County, Michigan.

This letter acknowledges the Kalamazoo River Study Group's (KRSG) invocation of dispute resolution pursuant to Paragraph 36 of our Administrative Order by Consent (AOC), final order DF0-ERD-91-001. As specified in your letter of January 15, 2004, your dispute is limited to the application of sediment cleanup objectives to soils. This letter attempts to reach agreement on that dispute consistent with the provisions of the AOC. In the interest of resolving the dispute and moving forward, we propose to:

- Replace certain Remedial Investigation/Focused Feasibility Study (RI/FFS) pages with the enclosed revised pages.
- Attach your comment letter of January 15, 2004, as Appendix O to the RI/FFS. Your dispute and point of view will become part of the administrative record and will be considered in the course of developing the Proposed Plan.
- 3. Bring the issue before the Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division's (RRD) Field Operations Quality Review Team (FOQRT), to determine a RRD position regarding the application of sediment criteria to the floodplain at Operable Unit 2 (OU 2). The FOQRT review will also become part of the administrative record, and will be available for consideration in development of the Proposed Plan.

As I mentioned in our meeting on January 9, 2004, I have already contacted the United States Environmental protection Agency (U.S. EPA) regarding certain KRSG concerns. It is apparent (see enclosed e-mail) that the U.S. EPA shares some of your concern with the application of sediment criteria to the floodplain. As the U.S. EPA will create the Proposed Plan and Record of Decision (ROD) for OU 2, we believe it makes sense to finalize this RI/FFS as-is and await the U.S. EPA's Proposed Plan to see how our respective concerns are addressed. The KRSG, of course, has the option between now and when the Proposed Plan is issued to compile its own technical evaluation and ranking of alternatives to submit for consideration. Further, the KRSG will have an opportunity to comment on the Proposed Plan itself.

That being said, I wish to respond to your letter and offer additional explanation where the text of the RI/FFS may have seemed unclear to you. The MDEQ responses to your general and specific comments follow.

General Comments

1. The RI/FFS focus on groundwater.

The notion that there are no findings of risk related to groundwater at OU2 is an exaggeration. The fact that there have been detections of groundwater contaminants (e.g. polychlorinated biphenyl (PCB), barium, cyanide, mercury, zinc, and bis[2-ethylhexyl]phthalate) in excess of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended generic groundwater criteria, soil criteria for the protection of groundwater, and/or generic groundwater surface water interface criteria show that the site represents (1) a release of hazardous substances, (2) a hazard to human health or the environment, or (3) a threat of a release of hazardous substances to the environment. Based on the available data, the MDEQ concludes that hazardous substances in groundwater are reasonably expected to vent to surface water in concentrations that exceed the generic groundwater/surface water interface (GSI) criteria. While a groundwater response action could be required under Part 201, it seems prudent at this time to place GSI compliance wells first to better evaluate the hazard and determine if contaminants are actually being transported to the river.

As you are aware, the RI/FFS is not a decision document. However the RI/FFS is required to consider the long-term uncertainties associated with various remedial actions. Groundwater costs were discussed to establish that (1) there may be additional remedial action necessary in the event contaminants are discharging to the river and that (2) any remedial design should not preclude future groundwater controls. As discussed in the FFS, it may be prudent in early design to evaluate the groundwater issue intensively to determine if there is cost efficiency in including groundwater protection components early. Any RI/FFS that does not objectively evaluate groundwater data or mention potential groundwater costs is incomplete and does not present an accurate statement of site conditions. As you are aware, costs with *and* without contingent groundwater responses were developed for each alternative. There is flexibility in the FFS that may not have been apparent on first reading of the document.

As written in the Blasland, Bouck, and Lee (BBL) letter of January 31, 2001, our agreements regarding groundwater were made with an understanding of how *recent PCB results* would be handled. Our agreement on PCB data was made irrelevant by other site data. In the RI/FFS, the MDEQ also evaluated BBL's inorganic data, non-PCB organic data, and historic PCB results which show significant exceedences of generic criteria. The data show, and Part 201 requires, that the RI/FFS should discuss *all releases*, and options to address exceedences of criteria. Further, Part 201 specifically establishes that cost can be a factor only in choosing among alternatives that offer adequate protection. Given the data, groundwater control was included in the evaluation because it offers adequate protection, whereas alternatives without groundwater control may not offer adequate protection.

2. Sediment Cleanup Objectives.

Application of sediment criteria to the 100-year floodplain in the OU 2 FS is not arbitrary. Your claim that a 100-year floodplain is "submerged as infrequently as once every 100 years" is technically incorrect. The 100-year floodplain, by definition, every year has a one percent chance of being inundated. Thus, the 100-year floodplain is always subject to inundation and to

the erosive forces of the Kalamazoo River. The hazards associated with PCB contamination of the floodplain are not limited to aquatic exposures during flood events; hazards are also associated with the transport of contaminated floodplain material to the riverbed, where PCB partitioning, aquatic exposure, and bioaccumulation are likely. We remind you that remedial actions taken to reduce the likelihood of PCB transport associated with one percent flood events would be consistent with the actions taken by members of the KRSG during (1) voluntary interim actions at the A-site, and (2) the King Highway Landfill remedial action. During those response actions, sheet pile was extended to an elevation *two feet above* the 100-year floodplain to protect against flood events, erosion, and resulting transport of contaminants. This sensible precaution was carried forward into the OU3 FS.

From the aerial photographs presented previously by the KRSG, it is apparent that the Kalamazoo River in the vicinity of OU3 is dynamic, with deposition of transient islands and resultant changes in river velocity and erosive forces along the banks. It is indisputable that the nature of a river is to meander in its floodplain; erosion of bank floodplain materials and transport of residual PCB contaminants to the river is only a matter of time. Further, it is a certainty that trees will eventually fall and animals will periodically burrow in the floodplain, disturbing residual contaminated material, making it unstable and more susceptible to transport.

One goal of remedies implemented under Comprehensive Environmental Response, Compensation, and Liability Act, 1980 PL 96-510, is to achieve a high degree of permanence. Under Part 201, remedial actions that significantly and permanently reduce the mobility of contaminants are preferred. The highest degree of permanence, considering eventual transport to the river, is achieved by removal of contaminants to levels protective of aquatic ecosystems. Since excavation in the OU 2 floodplain (relatively small) would occur under any action alternative; there is an opportunity at this operable unit, with minimal additional effort, to virtually eliminate risk in the floodplain rather than simply reduce it. In this case, the benefits of achieving the greatest possible degree of permanence out weigh the cost of the minimal additional effort. We are not presuming that the same cost-benefit could be realized on all other areas of the river.

From the site data available the +50/-30 cost estimates in the RI/FFS adequately cover the effort to achieve the sediment criteria in the floodplain.

The footnotes on page 6-8 and 6-9 are intended to make it clear that comparing criteria to post-excavation confirmation samples using an acceptable method of spatial averaging is appropriate. Any lack of clarity on this matter in the FS text does not warrant revision. This detail can be clarified in the Proposed Plan and Record of Decision (ROD).

3. An "ecologically-friendly" setback at Willow Boulevard.

As written in the text, for the purposes of cost estimation, the setback for Alternative 2C was assumed to be 50 feet. If a setback remedy is selected by the U.S. EPA, the setback distance could be evaluated and established with greater precision in remedial design. Consistent with the U.S. EPA's approach on other sites, it is likely the KRSG will be given the opportunity to undertake design and make the appropriate evaluations to ensure the design has a solid basis. If the KRSG believes ecologically friendly setback at Willow Boulevard is not protective or permanent, the MDEQ invites the KRSG to provide an analysis for consideration. It is puzzling that the KRSG would question the "risk management tradeoffs" of the alternative, considering the KRSG proposed a similar alternative for other areas of the river.

The MDEQ agrees with your opinion that Alternative 2C does not provide the greatest risk reduction of all alternatives, but the degree of risk reduction is not the only criteria by which a remedy is selected. The MDEQ's ranking was based on (1) our evaluation of the nine criteria established by the National Contingency Plan and (2) the fact that groundwater issues have been complicated by sheet pile at other OUs. It is not a requirement that the KRSG or even the U.S. EPA agree with our FS ranking. There will be additional evaluation in development of the Proposed Plan.

Regarding evaluation of the "community acceptance" criteria, it is rare that community comment to remedial alternatives is available before a Proposed Plan. Historic public comment is available in the case of OU 2; the U.S. EPA and the MDEQ believe utilization of the comments is reasonable. The MDEQ acknowledges sentiment expressed during the official comment period may differ from what has been documented to date. As the preferences of the Lakeside Neighborhood Association are not specifically known, their input will be specifically solicited during Proposed Plan. While immediate neighbors and members of particular neighborhood associations have a stake in the remedy, so does the downstream community; the opinion of all stakeholders is important to consider. The relative ranking provided in the RI/FS is MDEQ's and is preliminary, considering all criteria cannot be fully evaluated until the public comment period is complete. For this reason, the U.S. EPA requested that the MDEQ not identify a preferred alternative in the FFS.

4. Evaluations of short-term effectiveness and implementability of remedial alternatives. The MDEQ invites the KRSG to submit its analysis of potential short term risks for evaluation, though the MDEQ determined (and U.S. EPA concurred) that in the previous KRSG iteration of the RI/FFS, descriptions of short term risk were overstated. The MDEQ believes that engineering controls can be used to substantially reduce short term risks.

5. Regulations and requirements.

The physical separation requirement does not apply to "new disposal areas" and the Willow Boulevard A-Site is not a new disposal area as clearly stated in the third sentence of the paragraph. The enclosed pages provide clarification. The point of the paragraph was to establish that design must address leachate if it is coming out of the landfill.

The MDEQ emphasizes that sheet pile alone is not equivalent to a Part 115, Solid Waste Management, of the NREPA cap. At the Willow Boulevard A-Site and King Highway Landfill, use of sheet pile is a perfectly good idea because there are earthen berms that provide additional physical separation between the river and the waste. Using sheet pile alone to separate waste from the river is inadequate. The MDEQ landfill engineers recommend "pushing the waste as far back from the river as possible" at Willow Boulevard A-Site.

Regarding any perceived lack of clarity regarding the relevance of Part 31, Water Resources Protection, of the NREPA, Part 201 Rule 716(5) specifies procedures for demonstrating compliance with Part 31. The procedures accommodate the differences between venting groundwater and permitted discharge to surface water. Also, Part 201 Rule 716 (6) requires that the MDEQ identify water quality standards for hazardous substances developed under Part 31 (generic GSI criteria).

6. Estimated costs for Alternative 3 - Removal and Off-Site Disposal.

The cost evaluated is within the + 50/-30 estimate range, which is typical of a feasibility study. Costs previously provided by the KRSG were overestimated. Because the cost of Alternative 3 is the most costly, it is already the least preferred in that regard. Refining the cost would have little impact on the relative ranking of alternatives using the cost criterion.

7. References used to support MDEQ's assessment of conditions at the OU and community acceptance of each alternative.

The MDEQ is treating the BBL request as if it was made under the Freedom of Information Act, and has included the requested references (enclosed). In the interest of settling the dispute, there will be no bill for photocopying or staff time to respond to the request.

Specific Comments

1. In Section 1.2, the second sentence inaccurately describes Georgia-Pacific's ownership of the Mill. The Kalamazoo Paper Company owned and operated the Mill until 1967, not Georgia-Pacific (sic).

The MDEQ acknowledges that Georgia-Pacific did not own and operate the mill until 1967. The sentence in question does not use the term "ownership" and is meant only to describe which facilities, in terms easily understood by the public, used the OU for disposal. Further, the sentence is inclusive of dates beyond 1967, when Georgia-Pacific *did* own and operate the mill. The transfer of the site from the Kalamazoo Paper Company is adequately described in Section 1.2.1.

2. In Section 1.2.1, the last four sentences in this paragraph grossly misstate the function of the temporary cover placed over the Willow Boulevard Site. The temporary cover was constructed after an interim measure (i.e., removal of residuals from the River) was implemented. At the time of the removal action in 2000, it was anticipated that a final remedial alternative would be selected expeditiously, and Georgia-Pacific arranged for a local contractor to perform maintenance on the temporary cover. However, after three years, a final remedy has not been selected, and the temporary cover system, which was not designed as a long-term measure, is showing only some signs of insignificant deterioration. We suggest these sentences be removed as they provide no benefit to the analysis of alternatives. This issue is repeated in Section 4.1.1.

The existing cover is described in the RI/FFS as a "temporary measure" and an "interim cover," intended "to stabilize the surface and reduce possible erosion". It is not clear why the KRSG believes this description is a misstatement. The KRSG's previous version of the RI/FFS (Page 3-2), stated only that sand was placed; there wasn't *any* description of intended function. Deterioration of the interim cover has led to erosion of paper residuals into the river, a condition that is hardly insignificant. The MDEQ text was written to describe current conditions and to establish that the temporary cover will not be adequate over the long term.

3. Under Section 1.4 – Enforcement History, the last paragraph is misleading and suggests the KRSG and BBL have not been responsive to MDEQ's concerns. This paragraph does not include a full description of the long history of the development of the RI/FFS report as illustrated in Figure 1. Absent from this text is any recognition that a final draft of the RI/FFS was developed in 1999 followed by a draft of the Proposed Plan, or that the MDEQ

approved the use of a presumptive remedy approach only to decide after two drafts of the RI/FFS had been prepared to abandon this approach. There is no mention of the meeting on January 23, 2001 where the MDEQ and the KRSG met and discussed 125 comments, most of which were to expand the document to include information described in Technical Memorandum 9. The MDEQ makes no mention of the letter dated November 1, 2001, where the remaining 25 minor comments were addressed and additional information provided to the MDEQ. In addition, in 2001 we were told by MDEQ's project manger that the remaining changes were very minor, in fact "piddly" was the term used to describe them. The unresolved comments, if any, do not begin to account for the extensive changes made by the MDEQ in this most recent draft.

The paragraph was intended to state that the reason the MDEQ is completing the RI/FFS is because the previous version of the RI/FFS was rejected, because of the reasons identified in our letter of November 19, 2001. The last KRSG version was unresponsive to MDEQ's concerns. We believe inclusion of BBL's Figure 1 provides a reasonable account of site history. As an aside, the presumptive remedy approach was abandoned because the U.S. EPA determined it was not appropriate on this Operable Unit. There is no presumptive remedy for a saturated landfill, placed in a river and its floodplain.

4. Starting on Page 2-30, the MDEQ states that certain Aroclors are identified. This is not a completely accurate characterization since PCBs were not actually identified as comprising a particular Aroclor, but rather were merely quantified as that Aroclor.

This comment is puzzling, as the language in RI Section 2.10 is nearly identical to Response 3 in BBL's letter of November 1, 2001. BBL is apparently taking issue with its own text.

5. The statement in the last sentence of the second paragraph on page 3-6 is a non sequitur and does not belong in a section discussing site hydrogeology.

This statement was admittedly a poor way of saying that the conductivities of the residuals at the Operable Unit are not the same as the conductivities of residuals in the downstream impoundments, where mixing has occurred. The MDEQ was attempting to establish that BBL's conductivity estimates at the OU cannot be applied to any other portion of the Kalamazoo River Superfund site. A change has been made.

6. In Section 4.2.7, the fourth paragraph, the MDEQ implies that validation of historical data was attempted but could not be completed as prescribed in the quality assurance/quality control (QC) Review of Historical Studies Data Plan. This is incorrect. The prescribed method was followed, but the data could not be validated due to the lack of available QC data for the historic results.

This comment is not warranted as the fourth paragraph is nearly identical to text written by BBL in its previous version of the RI/FFS. We are left to acknowledge that BBL now has concerns with "implications" that may or may not be present in its own suggested text.

7. In the last sentence on page 5-2, the statement that "...generic GSI values are intended to ensure that contaminants in groundwater are not discharged to surface water" is not accurate.

The text paraphrases the title of Part 201 Rule 716, which is "Cleanup criteria for groundwater based on protection of surface water resources from hazardous substances in venting

groundwater." While it is better to state that the intent of GSI criteria is to protect against discharge of *unacceptable concentrations* of contaminants, we note that this distinction is not made in the title of the rule itself. It is clear that insignificant discharges of contaminants are not precluded because GSI criteria are not zero values. A change to the text was made.

8. Portions of the RI report inappropriately include discussions specifying portions of the remedy. For example, in Section 5.3 there are references to studies and evaluations that would be part of a Hydrogeologic Monitoring Program, including evaluations of zinc, mercury, and leachate; (sic).

The text does not specify parts of a remedy. Rather, this section simply states that additional monitoring could help resolve some of the pending questions regarding groundwater contamination. While the existing dataset may, at this time, be insufficient to justify a groundwater remedy, the dataset is also not sufficient to conclude that groundwater poses an acceptable risk. Further, the MDEQ text is actually less stringent than text previously suggested by BBL. For example, in the March 2001 version of the RI Section 4 and Section 5, BBL made statements such as, "a long-term groundwater monitoring program will be implemented as part of any selected alternative that entails leaving the residuals in place." Again, BBL is apparently taking issue with statements that it previously deemed appropriate.

9. In Section 6.2.1.3 and several others, the MDEQ implies that PCB concentrations greater than 12 parts per quadrillion (ppq) for wildlife or 2.6 ppq for humans present a risk. This is not an accurate assessment, as these values assume there is no risk at these levels, they do not imply that there is risk if PCB levels are greater than these concentrations.

The 0.00012 ug/L in the RI text is the "Wildlife value," the maximum ambient water concentration of a substance at which adverse effects are not likely to result in population-level impacts to mammalian and avian wildlife populations from lifetime exposure. The 0.000026 ug/L value is the "Human non-cancer value," the maximum ambient water concentration of a substance at which adverse non-cancer effects are not likely to occur in the human population from lifetime exposure through either drinking the water, consuming fish from the water, and conducting water-related recreation activities. The implication that any higher concentration may result in adverse effects is reasonable. The MDEQ emphasizes that remedial response objectives for this Operable Unit do not include specific surface water concentrations. If concentration-specific remedial response objectives (RROs) at this OU are set, they should be set according to the Baseline Ecological Risk Assessment; surface water concentrations should not exceed 0.00197 ug/L to protect mink. As the enclosed references establish, evidence of mink has been observed near OU3. A change to the text was made.

10. In Section 6.2.1.5, The MDEQ suggests that the information gathered during the RI is "...insufficient to definitively determine whether groundwater/leachate poses an unacceptable risk...." This is an overstatement because with reasonable assumptions, as those considered in the King Highway Landfill-OU Risk Assessment, there would be no risk associated with groundwater/leachate exposure. In the early versions of the Willow Boulevard/A-Site RI/FFS, BBL calculated a site-specific GSI using the MDEQ guidance; however, the agency did not accept this attempt to illustrate that a risk did not exist using reasonable assumptions.

The King Highway risk assessment did not evaluate GSI criteria (which were established with reasonable assumptions), and did not look at potential GSI impacts to wildlife. Considering the differences between King Highway Landfill and the Willow/A-Site OU, application of the King Highway Landfill risk assessment to OU2 is not appropriate. However, the MDEQ notes one relevant statement from the King Highway risk assessment:

- "...the presence of elevated levels of PCB in residuals is recognized, especially in terms of potential bioaccumulation/food chain effects. The greatest potential for ecological exposure and significant risk arises from the potential food chain effects on organisms."
- 11. In Section 6.2.1.5 there is a discussion of a groundwater/leachate monitoring plan. This is not appropriate for a section discussing site risk.

The MDEQ is again puzzled by the KRSG making such a comment. Language suggested by BBL in its last version off the RI/FFS included "development of a long term groundwater monitoring network to ensure there is no migration of PCB from leachate or groundwater." This comment represents the fourth instance in which BBL has questioned its own language.

12. In Section 7.2.2, description of Alternative 2, there are several sub-alternatives (e.g., On-Site Consolidation of Select Residuals) where sediment containing PCB concentrations of 6.5 to 8.1 milligram per kilogram will be removed. This is inconsistent with the RRO for sediment. Additionally discussions of removal suggest that at any location where PCB concentrations exceed the criteria, the area will be re-excavated. This approach does not consider the use of spatial averaging as discussed in general comment #2, above.

With little additional effort (and consistent with a +50/-30 estimate) removal of materials triggered by exceedences of the terrestrial criteria can probably achieve sediment criteria, where appropriate. Use of appropriate methods of spatial averaging as a tool to determine adequacy of cleanup is assumed.

13. Under Alternative 4 – Compliance with applicable or relevant and appropriate requirements (ARARs), the MDEQ states that Part 31 establishes state cleanup criteria to be used while "remediating rivers, creeks, and floodplain areas." This is not accurate and overstates the scope of Part 31.

We agree on this point; such language, previously provided by BBL in other versions of the RI/FFS, had been removed by the MDEQ from all other sections of the document. Leaving the inappropriate language here was an oversight and a change has been made.

14. It is not clear why a discussion of Toxic Substances Control Act (TSCA) as an ARAR is only included in the analysis of Alternative 4.

TSCA is specifically discussed in the analyses under Alternative 1 ((Page 7-4), Alternative 2 (Page 7-12), and Alternative 3 (Page 7-32). If the hard copy version you received does not include these discussions, please let us know.

15. The Weighting of Various Alternatives in Table 7-4 produces several counterintuitive results that suggest revision of the comparative analysis is warranted. For example, Alternative 3 (Complete Removal) is rated higher than three of the consolidation alternatives, and rated

lower than only Alternative 2C, which is quite similar to the lesser rated consolidation alternatives.

Perhaps BBL is reading Table 7-4 incorrectly, or has not reviewed the supporting pairwise comparison pages (see Appendix N). Looking at the pairwise analysis by criteria, Alternative 3 is rated lowest in terms of cost, implementability, and higher than only "no action" in terms of short term effectiveness. This is intuitive. Alternative 3 is clearly the most protective, has the most permanence, and is most likely to get the state and community acceptance. In terms of ARARs, such as Part 301 and Part 303, all action alternatives may be restricted in some degree because of floodplain construction constraints. While overall ranking may seem counterintuitive to BBL, when the ranking is broken down according to criteria, the basis for the overall ranking is clear.

16. Further site investigations for the King Mill pipe, residential soil sampling, and groundwater should not be specified in the RI/FFS for the WB/A-Site OU.

These unknowns must be resolved in design, as they could impact the scope of the remedial action.

We trust our revisions, our proposal to attach your comments as Appendix O to the RI/FFS, and our commitment to clarify the application of sediment criteria with the FOQRT is responsive to your dispute. The MDEQ now considers the RI/FFS for OU 3 a final document.

If you have any questions regarding anything in this letter, please contact Mr. Keith Krawczyk, Project Manager, Specialized Sampling Unit, Superfund Section, at 517-373-4103.

Sincerely.

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Enclosures

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Keith Krawczyk